The Builder.

VOL. XXXII.—No. 1650.

Sir Balthazar Gerbier.

LEVER, versatile Sir Balthazar Gerbier, painter, architect, diplomatist, colonist, and master of the ceremonies, the travelling companion of Charles I. and the Duke of Buckingham, and the friend of Rubens and Vandyck, does not deserve the neglect into which his name has been allowed to drop. Walpole notices him pretty fully, but the account he gives is incomplete and inaccurate. The only trustworthy life of Gerbier is the short one communicated by Mr. Papworth to the Dictionary of the Architectural Publication Society. In the present age, when it is necessary for those who wish to excel to keep strictly to their subject, versatility is looked upon with suspicion, and Gerbier has lately been called by a popular writer, "a restless architectural quack and adventurer." This is a very unjust description of him, and as it happens that the library of the British Museum contains a curious collection of his printed works and two of his MSS., we will endeavour to piece out his history from them; though this is not the first time that Gerbier and his works have been mentioned in these pages. Gerbier was one of those men who are fain to take the public into their confidence, and therefore we are able now, 200 years after his death, to see him as his contemporaries knew him.

The parents of Gerbier were Huguenots who lost all in the religious persecutions of France, and had to fly from their native country. His father was Anthony Gerbier, who held the barony of Ouvily, in Normandy, and his mother was Radegonde, a member of the family of the Lords of Blavet, in Picardy. He was born at Middelburg, in Zealand, about the year 1591, soon after his parents had settled there on leaving France; but when a boy he was taken to that country by an elder brother's means, and was educated there. On growing up to be a man he returned to Holland, and soon after joined himself to the suite of Noel Caron, the Dutch Ambassador to London. In an "Address to the Parliament of England," which he issued in the year 1650, he says, that "zeale towards this nation made him come to it in 1616 from Zealand, his native country, to apply himself to the publique service." He attracted the attention of Sir George Villiers, afterwards Duke of Buckingham, who was pleased with his good handwriting and "skill in the sciences," and took him into his service. Here he contrived the scenes for masques and shows that Buckingham was pleased to exhibit before his great visitors; he altered his employer's houses, drew plans, and painted portraits, and had the spending of large sums of money upon books, pictures, and rarities of all kinds. He also invented "warlike engines" for the defence of Rochelle, and made himself useful in many ways. When the Prince of Wales and the Duke of Buckingham made their romantic journey to Madrid, Gerbier attended them, ostensibly in the character of a painter, and he drew a miniature of the Infanta, which was sent over to King James. He was, however, employed in the treaty of marriage, and afterwards wrote an interesting vindication of the king, prince, and duke, which still exists in manuscript in the British Museum (Sloane MS., 4,181). His duties must have been multifarious, for the Duchess wrote to her husband while he was away:—"I pray you, if you have any idle time, sit to Gerbier for your picture, that I may have it well done in little." Buckingham is said to have made the most of his opportunities for collecting pictures when in Spain, and he employed Gerbier to look out for them, and to catalogue them when they had been collected. On the accession of Charles I. Gerbier found a wider field for the exercise of his talents, but although he left the service of the duke he always continued his esteem for his former master, and describes him in one of his latest tracts as "the matchles of all the subjects in the world." His first public employment was as envoy to Holland to meet the representatives of France and Germany, and to arrange for the restitution of the Palatinate. He was afterwards employed in several transactions of State, and was Resident at Brussels for several years. In 1628 he entertained the king and queen at supper, and in the same year he was knighted at Hampton Court. He was appointed Joint Master of the Ceremonies, with Sir John Finett, after whose death he became sole master, and in 1641 he was naturalised and took the oaths of allegiance and supremacy. Charles I. seems to have stood by his servant, and always spoke of him with affection. He said, "He hath done me long and faithful service"; but Gerbier had enemies who maligned him to the king, and said he ought to be hanged by the legs. These enemies showed themselves in 1642, when it was bruited about over London that Gerbier was a Papist, and sheltered Papist priests in his house at Bethnal-green, and it was further reported that he "had six brasse pieces in his house wherewith he might batter down all the houses on the Greene." He published a small pamphlet on this "wicked and inhumane plot," in which he stated that he was born in the reformed religion, "and suffered for the same in the wombe of his mother, who, being with child, fled from the bloody persecution of the French against the Protestants." This treatment, and the rising disturbances between the king and his Parliament, disgusted Gerbier, so that he requested permission to retire from the country, and he was absent from England for seven years. Trouble continued to follow him abroad, for three of his daughters were inveigled from him, and received into the English nunnery in Paris. He admonished them, and tried to get them to confer with him on questions of faith, but all without avail, and he wrote a narrative of his ill success. At the end of his "last admonitions" (Harl. MS., 3,384), he added an address to his sons and two remaining daughters, who continued Protestants, in which he pointed out texts of Scripture to strengthen their faith, and give them arms against the Romanists. He also composed a prayer "for your poor sisters who sitt in darknesse." In 1648 Gerbier returned to England, and, being in want of money, he thought to make it by the erection of an academy, "to tend to the glory of God, the honour of the nation, the improvement of all lovers of vertue, and the breeding of youth therein." The scheme was a praiseworthy one; but instead of growing with success, it was started in a highly developed state, and soon decayed. Hebrew, Greek, Latin, French, Italian, Spanish, German, and Low Dutch, history, constitutional law, natural philosophy, mathematics, arithmetic, geography, and several sorts of good writing, were all taught. The terms were 6*l.* a month for the teaching (including 3*l.* for learning to ride the great horse). Gentlemen were boarded at 3*l.* a month. Rules and regulations were made, and part of the scheme was the weekly reading of lectures by the master or by the professors. At these lectures, which took place every Wednesday, at three o'clock, any person was allowed to speak. Several of the lectures were printed, as those on military architecture, navigation, cosmography, geography, the art of well speaking, &c. The last laid Gerbier open to the satire of Butler, who entered in his fictitious will of the Earl of Pembroke,—"All my other speeches, of what colour soever, I give to help Sir Balthazar's art of well speaking." The lecture on music seems to have been like more modern entertainments; for the advertisements tell us that "those who are expert in the art have promised to make good what the lecturer says in commendation of it." The summer quarters of the academy were at Bethnal-green, and the winter in the Whitefriars. The academy was to some extent an imitation of the Museum Minervæ, which was founded by Sir Francis Kynaston, in Covent-garden; but it is a mistake to suppose that it was in any way a precursor of the Royal Academy, because it was not a fine-art school. The object of the founder was not merely to teach the languages as at ordinary schools, but to educate boys in the fashionable arts of the time, so that they might become men of the world. In one of his numerous prospectuses, Gerbier professes "to lend one shilling to six gratis to such as are in extreme need, and have not wherewithal to endeavour their subsistence, whereas week by week they may drive on some trade." He was full of schemes for the relief of the poor and the extirpation of usury; but although he addressed himself to the Parliament, his endeavours were fruitless. His "Art of well Speaking" (1650) is dedicated to the Parliament and their Speaker, Wm. Lenthal, "the supreame power of this nation," who are told that they are the public voice, and that voice is the voice of God. In the same year he laid tenders before a Committee of the Council of State on the Flanders debt, the public security, the cloth trade, the silk manufacture, and the art of refining salt, but they do not seem to have appreciated his zeal for the public welfare, and he therefore left England. Gerbier was not long idle, for in 1653 he published at the Hague a book on the pernicious effects of wicked favourites in the various European nations, where, in each case, he lays the faults of the King upon the shoulders of the favourite. Literary work was only a means to an end with Gerbier, and not being contented to remain inactive in Holland he sailed with his family for South America. Here he hoped to have been able to found a colony, but he was treated ill by the Dutch governor, at Surinam, and violently assaulted by the populace. He was besieged in his house, when one daughter was killed, another wounded, and his own life threatened. His papers were taken from him, and he was sent home to Europe, but he still had faith in his colonising theories, and published at Rotterdam "a summary description, manifesting that greater profits are to bee done in the hott than in the cold parts of America; also advertisement for men inclined to plantations in America." The Restoration now occurring, Gerbier was again in the midst of active business, and the few remaining years of his life were fully occupied. He came over to England and designed the triumphal arches which were erected to welcome the arrival of Charles II. The chief part of his attention was now devoted to architecture, and two of his latest works contain the results of a large practical experience of building operations. The first of these was "A Brief Discourse concerning the three chie

Principles of magnificent Building, viz., Solidity, Conveniency, and Ornament," dedicated to the King and to the two Houses of Parliament. In his dedication to Charles II. the author claims the office of Master of Ceremonies, because it was confirmed unto him during his life by Charles I., and he also affirms that the place of Surveyor-General was intended for him after the death of Inigo Jones. In that to the Lords and Commons he mentions a printed paper which he had presented to them concerning the cleaning of the streets, the levelling of the valley at Fleet-bridge with Fleet-street and Cheapside, and the making of a sumptuous gate at Temple Bar. The discourse is full of sound advice as to the three points mentioned on the title. The author writes: "I must also advise builders on high grounds to cause their surveyors to search for springs, and shun them, which serve better to fill up glasses to allay the vapours of Gascony wines than to make a pond in a sellar," and he illustrates his meaning as to solidity by the following anecdote:—"The first stories ought rather to be vaulted than boarded, to prevent such an accident as happened to Lewis 13th, French King (and his Queen at the ball) when the floore of the roome (with all the company), fell down; the King and Queen only remaining (by a special providence) on the hearth of the chimney, setting under the cloath of state." How good a subject this would make for the painter. The necessity of conveniency in respect of width and size of stairs is set forth, and it is added "a noble paire of staires should have a cupelo, and no windowes on the sides; which for the most part serve but for rude and unadvised men to break." The importance of good taste in ornament is insisted upon, and it is hinted that "the greatness of a sovereign consists not in the quantity of stone and timber heapt together, [for] the quarries possess more stone and the woods more timber than a banquet-room." Gerbier ends his little treatise with the hope that the inhabitants of London will take the right course to improve the form of their streets, to make St. Paul's Cathedral worthy of their city, and to raise a palace fit for their King. The "Counsel and Advise to all Builders" is still more curious than the little book we have just described, for it is introduced by forty-one dedications to eminent persons, from the Queen-Mother to the courteous reader, and these dedications contain much curious matter. The author excuses himself for the number of these epistles by the example of Antonio Perez, Secretary of State to Philip II. of Spain, but adds that he has more reason on his side, because his object is public interest. The book is "freely offered to a number of persons who either themselves or friends may have occasion to make use of it, it is freely offered as to the upper so to the lower end of a table, like a fresh gathered fruit, and none of those who are pleased to accept it are craved to patronize it." Much ingenuity is exhibited in the reasons that are given to each of the great men for the dedication of the book to them. Many of these were building new mansions at the time, and some might have benefited by the advice given; for instance, Lord Chancellor Clarendon would probably have saved much money had he taken it. The Earl of Southampton is told that he leads the way in building, and the Earl of Bedford that it cannot be improper to offer the book "to the most noble successor of the author of the Piazza, whereby this great metropolitan of Albion is beautified as the firmament is by the sun among the other starres." The Earl of Leicester is complimented on Leicester House, the Earl of St. Albans on his buildings in St. James's-fields, and the Earl of Stafford on Tart Hall. The Earl of Manchester, as chamberlain, is supposed to be able to judge of what is needful in a palace; and Lord Brouncker, as president of the Royal Society, will be particularly careful to expose ill builders who "well deserve to be comprehended in the bill of mortality, since by their exorbitances happen many irreparable accidents, viz., chimneys, which, falling through the roofs of houses, kill good people in their beds, who contrive roomes, windowes, and doores which drawe upon inhabitants ill and infectious aire." Although these dedications are written to nearly all the great officers of the kingdom, Gerbier finds a place for his pupil, William Winde, and gives him good advice as to the use of perfect lines and careful drawings. This preliminary matter occupies nearly half of the book, and 100 pages only are left for counsel and advice, but a large amount of practical information is pressed into this space. The author again draws particular attention to three essentials of good building, viz., solidity, conveniency, and ornament. He was well before his time, and we find him throughout his book continually insisting on the importance "of placing a building where good ayre is, and that neither chimneyes nor doores may be so placed as to serve for the attracting of infectious aire, which kills more than the sword or the seas overturnes ships." He had a peculiar aversion to the north-west wind, and objected to windows being exposed to that quarter. The builders who are counselled in this book are the proprietors, and the architects are styled "surveyors." The clerk of the works is to be versed in the prices of materials, and to know the cost of all things belonging to a building. He must provide work for the workmen with judgment, so "that the carpenter may not stay for the bricklayers, nor the bricklayers nor the masons for the carpenters." He ought also to be careful in the distribution of materials, and must be discreet even in the distribution of nails, for the pockets of some carpenters are said to partake much of the quality of the ostrich's stomach. His eye must be over all the workmen, to check carelessness; but the owner of the buildings should not choose a master workman for his clerk of the works, because the workmen will not obey one of themselves. This manual has an historical value in that the prices of all kinds of material and work are carefully set down. About the time of printing these two books Gerbier had an opportunity of showing his own skill in building, for he was commissioned by Lord Craven to build him a new mansion at Hampstead-Marshal, Berkshire, and the foundation was laid in 1662. In Knyff & Kip's "Britannia Illustrata" (1707) there is a view of the house and grounds. The buildings are extensive; and although the front is in rather *bizarre* taste, it will bear comparison with most of the other mansions figured in this book. Gerbier's last book was published at Oxford in 1665, and entitled "Subsidium Peregrinantibus; or, an Assistance to a Traveller in his Convers with Hollanders, Germans, Venetians, Italians, Spaniards, French." It is not, as might be inferred from the title, to teach languages, but to give the traveller such information as would assist him in forming a just opinion of the places he visited. Walpole makes his Balthazar even more versatile than he was, for he attributes to him a play called "The False Favourite Disgraced," which was really written by his eldest son, George. This tragi-comedy was printed in 1657, in which year George Gerbier *alias* D'Ouvilly, translated Theuet's "Lives of Illustrious Personages," added to the edition of North's "Plutarch," published in 1657.

Sir Balthazar Gerbier did not live to see Hampstead-Marshal finished, but died in 1667, aged about seventy-six years, and was buried in the chancel of the church close by the house. Captain William Wind finished the house, but in 1718 it was totally destroyed by fire. Dobson painted in one picture his own portrait with those of Gerbier and Sir Charles Cotterel, and Gerbier's portrait has been mistaken for that of Inigo Jones.

It is somewhat difficult to sum up Gerbier's character in a few words, because the real work of his life is nearly lost to us, and we only possess his ephemeral pamphlets; but he has pictured himself to us as a man of active mind, sound judgment, and good taste. Had he been less versatile he would probably have made a greater figure in history; but he did sufficient good work in his day to make us feel some interest in the particulars of his life.

THE ANCIENT WORK OF THE COPPERSMITH.

THE subject of the earliest artificers' work in copper, is one that possesses extreme interest, for many different reasons, and it is one as to which much further information than we actually possess is extremely desirable. The chief difficulty that attends the commencement of the inquiry is this. As a general rule, in art, the simpler processes are more ancient than the more complex. Now the production or the working of a metal of any description may naturally be supposed to be more ancient than that of any alloy of that metal. But our earliest relics of any cupreous arms, tools, or other objects, are not, as a rule, of pure copper, but of some kind of bronze, or copper alloy. It is perfectly well known that certain alloys of copper are far more manageable by the workman, as well as harder and more available as tools or weapons, than is the pure metal. But we must regard it as probable that a considerable amount of skill had been attained in the smelting and casting of copper, before the ancient coppersmith thought of alloying the metal; and as utensils of bronze so very far precede, in the archæological series, any evidence of the discovery and the manufacture of iron, the commencement of this early metallurgic work seems to be pushed back into an almost unattainable antiquity.

The best source of light which we may now expect to gain on this point is the careful survey of the ancient world, including not only topographical information, but that accurate physical investigation which shall tell us of the source of the wealth of the future and of the traces of the industry of the past. Here archæological research joins hands with industrial inquiry. When we have ascertained, as we may properly hope to do, from what sources the various nations of antiquity, whose history we seek to trace, derived their metals, we shall have the first positive information as to the origin of the various descriptions of ancient bronze.

Copper occurs in a virgin or native state in many places, especially in out-crops. It also occurs in veins, and "pockets," or nodules, which the French miners call *géodes*; where it ramifies into crystals, and into delicate efflorescent threads. In Siberia is found the *cuivre oxydulé*, which resembles a dusky-red stone, sparkling with specks of metal. Black oxides, and blue and green carbonates, known as agarite and malachite, accompany native copper. Specimens of the former are found at Chessy, in France, of a lovely dark-blue, resembling, but darker than, that of the blue vases usually exhibited by chemists. Malachite occurs in the Oural mountains, and its use in Russia as an article of splendour is well known. The ordinary yellow *pyrites* is of frequent occurrence in Wales and elsewhere; and its little bright pyramids and parallelopipedons may readily be mistaken, by the unwary, for gold. The "peacock-copper" of Tuscany has iridescent colours. Like the yellow pyrites, it is a double sulphuret of copper and of iron. The Fahlerz, or grey copper, of the Germans, contains, besides copper and iron, silver, arsenic, and antimony. It is smelted for the sake of the silver and the copper; but is extremely difficult to manage, from the complex nature of the ore. But it is highly probable that in this grey copper we have an inclination of some of those deposits of natural alloys, which fact suggested to the ancient metallurgists the production of bronze.

Tin,—which, with copper, constitutes true bronze,—is stated in the works on metallurgy to be unknown as a mineralogical neighbour of the latter metal. It is not known to occur in a virgin state. The Cassiterides, or tin islands of the ancients, whence this valuable metal was brought by the Phœnician navigators before the time of Homer, are as yet undetermined; though some authors have sought to identify them with our Cornish coasts. Tin is usually found as a crystallised oxide, of a chocolate-brown colour, and of a form closely resembling rock crystals. More rarely it occurs in what are called stanniferous sands, either yellow, rose-coloured, or translucent as crystal. It is found in India; supplies at present are derived from Banca and Malacca, as well as from Cornwall. It also occurs in Brittany. The island Vectis of the early navigators, has been explained to lie at the mouth of the Loire; to be the island Saint Michael; to be the Isle of Wight. From each new guess we come to the same result,—the importance of a better physical survey of the Old World.

There is little doubt that, on descending to historic times, tin was brought to the basin of the Mediterranean from India, from Gaul, and from Britain. The mineral was readily separated, by washing, from the sand in which it was found, and then exposed to heat. As the ore is a compound of oxygen with tin, a charcoal fire will effect the reduction of the metal, so that the process has little varied, in principle, from the earliest date to the present time.

No ancient author speaks of bronze, the *æs*, or *chalcos*, of the Classic writers, as if possessed of any acquaintance with its compound character. The hardening, tempering, and working of bronze is spoken of as we might now speak of the manufacture of iron. When not only the sword and the hunting-knife, but the chisel, the

needle, the axe, and the fish-hook were made of bronze, there can be little doubt that the early craftsmen studied and experimented how best to give to their work the hardness of the flint, combined with the elasticity or tenacity of bone.

Very recent discovery has thrown a ray of light on this difficult subject of inquiry. In the immediate vicinity of Sidon, in the ancient Phœnicia, have been recovered not only copper-mines, but a closely neighbouring lode of stanniferous crystals. It is also stated that coal sufficient to carry on the operations of smelting is in the immediate nighbourhood. A ridge of hills runs east and west in this part of Syria, terminating chiefly on the coast. Steps are in contemplation for the reopening of these ancient mines. But their discovery is more important as an archæological than as an industrial question. It tends to show that Nature herself indicated the original mixture of bronze. The position of a source of this alloy in the very head-quarters of the most famous mariners of antiquity is another most instructive fact. Hitherto it has been utterly inexplicable why the tin of Cornwall or of India should have been sought in order to mix with the copper of the Mediterranean shores. But when the alloy had once been indicated, or casually found, by the smelting of contiguous ores, the search for the rarer metal would have been a natural result. Again, what occurs at Sidon may have occurred elsewhere, and the very earliest bronze may have been indicated by Nature herself.

Brass, which is an alloy of copper and zinc, is a much more modern alloy than bronze. We know but little of its existence before the imperial age of Rome. We find that new brass coins were struck by Julius Cæsar, which Pliny says contained *cadmia* from the Livian mine, and were equal to the excellence of *orichalcum*, for *sestertii* and *dupondii*. *Orichalcum* is sometimes spelt *aurichalcum*, as if it meant copper of a golden colour; but its etymology really denotes "mountain copper," and some native alloy was probably first intended. *Cadmia* is taken to mean calamine, or zinc ore. Strabo speaks of a "false silver," which, mixed with copper, became a *krama*, or alloy, which some called *orichalcum*. Copper itself is said to have derived its name from the island of Cyprus; and brass, or rather the Greek word chalcos, from Chalcis, in Eubœa. The Corinthian brass, which is occasionally mentioned as of extreme value, is generally taken to be the same as *electrum*, or a mixture of gold and silver. Specimens of an argentiferous gold, rich in silver, from Transylvania, are to be seen in the British Museum, under the name of *electrum*, which attract attention from the sharpness of the crystalline forms. As the knowledge of metallurgy passed from a craft into a mystery, and especially when the expectation of being about to discover the secret of the transmutation of metals had seized the imaginations of men, tin was known by the sign of Jupiter, copper by that of Venus, gold and silver by those of the sun and the moon.

The specimens to be found in museums of ancient objects in bronze are numerous and important. We are not now referring to the statuettes and sculptural bronzes, amongst which may be found some of the most perfect specimens of ancient art anywhere extant. One of the latest additions to the bronze-room of the British Museum is a female head, of unrivalled beauty; and also of great interest, as showing much of the method of the ancient workers in bronze. But we rather call attention to such undated specimens as the bronze Etruscan *krater*, found at Capua, with mounted Amazons round the rim; and the draped female figure from Sessa, on the Volturno, a town famed for the rare beauty of its women,—one of the most ancient and interesting examples of casting in bronze.

Ancient bronze has not the indestructible character of the precious metals. The disinterment of a vase, may, unless special care be taken for its preservation, lead to the rapid crumbling of the object into dust. At Baiæ, near Naples, is an ancient cemetery, in which the different orientation and structure of three super-imposed strata of tombs bear testimony to the successive occupation of the spot by three distinct races. The Oscan, or Etruscan tombs, in this cemetery, which are built of square stones, with a pyramidal roof, not unfrequently contain large bronze vases, of nearly globular form, which are found bedded in a layer of perhaps not more than 6 in. of consolidated dust. The late Count of Syracuse opened many of these tombs, and recovered many interesting objects; amongst others, the dressing-case of a lady, with implements in bronze. It was his Royal Highness's custom to have the bronze objects plunged into boiling water immediately on being unearthed, which was stated to be the only known precaution against speedy decay.

An extremely interesting question is as yet unsolved as to the method of coinage in use in ancient times, not for copper alone, but for gold and silver. The subject is intimately connected with that before us, from the fact, that the dies used in coining were exclusively of bronze or of copper. From the beauty and sharpness of many ancient coins it is evident, not only that the art of the die-sinker, as matter of graceful taste, was of a very high order, but also that the metallurgic or mechanical part of his craft must have been adequately advanced. That means of hardening bronze, with which we are not now familiar, formerly existed, seems hardly to be questioned. But our most accomplished numismatists speak with no little hesitation as to the process by which the impression of the die was communicated to the coin.

We are not, however, without some positive information on the subject, although more is still very desirable. The British Museum possesses amongst its numerous treasures an ancient Roman die. This is an iron implement, formed in two parts, one being a socket, into which the other fits. In the middle of the socket is a circular recess, into which a copper matrix is fitted. The plunger, or upper portion of the die, has a similar recess, fitted also with a copper die. The disc of metal to be struck must have been placed on the lower die, and the guidance of the socket served to bring the upper die into exact opposition to the lower. There is no collar in order to keep the coin central on the die. It is possible that a loose collar may have been lost, but the probability is, that the metal instrument is complete as it exists. The reason for this opinion is the great irregularity with which many ancient coins are struck. It is rare to find the impression central. A piece of unstamped metal is often found on one side, while the device overlaps the metal on the other. This irregularity would, however, have been very natural, if the disc were simply placed on the die by the workman, without any collar to confine it. In the recent improved process for striking coins and medals, a loose steel collar is added, which at once gives a central position to the device, secures the exact roundness of the coin, and serves to mill or ornament the edge. The process may be watched any day at the International Exhibition at South Kensington. It is to be lamented that the modelling of the large gilt medal, which has been recently issued by the directors of that institution to the exhibitors, does not equal the mechanical excellence of the machinery by which it is turned out.

The question remains, of the mode in which force was applied to the dies. The word "struck" is still employed, although it is, in fact, a gradually increasing pressure which is brought to bear on the disc. In the earliest coins it is very possible that a violent blow was actually given to the die. The square depression on the reverse of many ancient coins seems to point to this method of formation. But the British Museum die has not been so treated. It is made of excellent iron, more closely resembling that of Styria than any now commonly made, but which we believe to have been procured from the Apennines. But the plunger, or upper part of the instrument, has no marks such as a series of violent blows would have occasioned. Our readers who are accustomed to the blacksmiths' setts will understand what we mean. Nor is this freedom from foliation or crushing due to want of use. The copper dies inserted in the coin bear signs of considerable use.

We think that the inference is unavoidable, that the iron must have been inserted in wooden blocks; and that pressure must have been applied as it is in the oil-presses and the maccaroni-presses of Italy, at the present day, by the combination of the lever and of the screw. The habits of the peasants and lower classes of the Peninsula, especially in the wilder parts, as in the Abruzzi and the Calabrias, are wonderfully little changed since the imperial times. At Canosa, for example, the very same grittiness in the bread which Horace deplores in his journey to Brundusium still endangers the teeth of the eater. The mode of applying enormous pressure which is now in use is, there can be little question, as ancient as it is effective. Rude in its details, it is essentially in principle one with the latest machinery of our mints.

The dies in the instrument which we are describing seem to be of copper, and bear marks of rough usage. But it can hardly be doubted that among the Greeks, and probably the Asiatic nations, hardened bronze was employed. Some of the vexed questions as to ancient coins hinge, to a great extent, on this subject of the hardness of the die. Thus when coins are found very closely resembling one another, but not *fac similes*, it is supposed that they are produced by different dies cut and used in the same year. This, of course, is possible, although it is also possible to ride such a hobby to death. Thus De Sauley figures, in his "Recherches sur la Numismatique Judaique," plates xiv. and xv., eight copper issars, or assarions, which differ very widely in their treatment of the palm-tree and the vine-leaf which they bear, in the arrangement, and even in the type or form of the letters on the field; and ascribes them all to the same year,—viz., 134 of the Christian era. This extraordinary attribution is only brought within the limits of possibility by the assumption of the use of numerous dies in the same year,—an assumption, however, that does not account for the artistic and palaio-graphic differences of the pieces in question. It has been clearly shown by a writer in an important contemporary publication ("Bible Educator," parts xiv. and xv.) that the year II. on these coins refers to the second year of the seven, a constantly-recurring date, the distinction of which, on the coins used for sacred tribute, was important. Thus the absurdity of attributing 30 per cent. of all the known Jewish coins to at the outside 9, out of 184, years, will, it is to be hoped, not disfigure any further works on coinage.

The distribution of copper over the surface of the earth is wide and abundant. In the Old World it occurs in Asia Minor, Italy, Spain, France, Morocco, Algiers; as well as in Persia, Abyssinia, Congo, the Cape of Good Hope district, and Madagascar; and in England, Germany, Sweden, and Russia. It occurs on the shores of Lake Baikal, in China, and in Japan. It is found in Australia. In the New World it occurs in Canada, in the United States, in the Antilles, in California, and in Chili. It tinges the promontory of Cape Farewell. These are only the best known and more conspicuous deposits, as they appear on the face of the map. In Russia, copper mines were worked, in prehistoric times, in Siberia, in the Bashkir land, and in the Kirghis steppes, by a people of whom we have no account. Early in the present century the now famous mines of Nijni Tagil were commenced; and soon after it was discovered that the whole of the eastern slope of the Oural, from Voskresensk in the extreme north, to near the village of Malvatina in the extreme south, abounded, more or less, in copper. Tin is also found in the Oural, though it is not now worked. The yield of the ore at Nijni Tagil, from 1814 to 1830, was above 3 to 4 per cent. In 1836 it rose to 5 per cent.; from which it has gradually dropped to half that proportion. The depth of the mines here is ninety fathoms. Near Simbeisk, in former times, it was found profitable to work a copper ore which contained only 2 per cent. of metal. Old clay pots have been found here, which were used by the early smelters, and which indicate from their great rudeness, a richer ore, as no results could be obtained from the present ore by so rude a process. At the fair at Nijni Tagil copper ore sold, in 1870, at from 2½ to 3 kopecks per pood, being equal to from 3s. 11d. to 4s. 8d. per ton; so that the copper is made for 47l. 5s. per ton. The Oural Mountains yield, besides copper and tin, gold, silver, lead, sulphur, chrome ore, diamonds, jasper, marble, talc, alabaster, and steatite.

Spain was the great source of the supply of metals for the Romans, as well as for their rivals, the Carthagenians. Ancient mines have been discovered in the Spanish peninsula, some of which have been resumed with profit. Veins of copper and of tin, as well as deposits of lead, of iron, and of antimony, await the industry of the Spaniard, whenever the good time shall arrive when Spaniards become industrious.

In the Alpine districts, Piedmont is rich in metalliferous strata. The Val d'Aosta is rich in copper pyrites, as the Val d'Anzasca is renowned for gold pyrites. The mountains which border the Gulf of Genoa, are rich in copper. The hills of Modena, famous for their

quarries of Carrara marble, contain copper, as well as iron, lead, and silver. On the north portion of Tuscany are found veins of argentiferous copper. From the mines of Campiglia the bronze of the ancient Etrurians is said to have been derived. In fact, the whole western slope of the Apennine chain, running to the south-east from the shore of the Gulf of Genoa, is rich in metalliferous strata. The silver which formed the materials for the famous coinage of Syracuse, was derived, it is thought, from the Calabrian Apennines.

From this hasty glance at the regions whence much of the metal used in the bronze period must have been derived, indications may be grasped which the advance of physical geography will convert into positive sources of knowledge. It would seem that copper, like gold, existed in a virgin state, and that the native lodes and the richer ores were successively exhausted, until the ore became too poor to repay the rude process of the ancient smelter. It also appears clear that, in certain places, as at Sidon and in the Oural, tin is even now found in close proximity to copper. In other places calamine, or zinc ore, is found near copper lodes. We infer that both bronze and brass were thus, in the first instance, the natural products of certain rich lodes or ores. As these, in the long lapse of time that preceded the use of iron, became exhausted, commerce, taught by metallurgy, sought the rarer metal, tin, in those spots whence it is now derived.

GREY ABBEY, COUNTY DOWN.

A MONOGRAPH of this abbey, so far as it remains, is sent to us by Mr. James J. Phillips, of Belfast, as a contribution from the other side of the Channel to the study and illustration of Cistercian architecture, which seems likely to be a *cheval de bataille* for architects and archæologists for a time, now that the way has been so energetically led by an able English illustrator of the subject. The Abbey of St. Mary of Grey is not far from Belfast, and the portions remaining include the church (the greater part of the main walls and two of the "crossing" arches), the walls of the chapter-house, pantry, kitchen, and refectory to a height of about 4 ft. from the ground, except the south and west walls of the refectory, of which more is standing; the south end, with its gable and lancet windows, is nearly complete, though much overgrown with ivy. From the regularity with which the other walls are reduced to their present level, there can be little doubt that the building has, as in so many similar cases, been systematically used as a quarry, though there is no cut stonework in it, except on the jambs of the doors and windows. It is now, we are informed, in good hands, and under careful custody.

The plan tallies with the ordinary Cistercian plan in its disposition; the long building (now to be called *Domus Conversorum*) usually found on the west side of the cloister court, has entirely disappeared as far as visible tokens go, but an excavation would probably reveal its foundations. The remarkable incident in the plan of Grey Abbey is the fact of the nave consisting only of a single aisle, an arrangement quite inconsistent with the ordinary Cistercian plan. In explanation of this the author adopts the opinion of the diocesan architect of the district, Mr. T. Drew, R.H.A., who suggests that this nave was an antecedent Irish work, similar in type to other ancient churches of the diocese, which are "long, narrow, rectangular buildings of such striking similarity in plan, proportion, severe simplicity, and such architectural details as remain, that they must be recognised as the work of a unique and distinctive school of church builders." Seeing that the chapter-house and fratry have the remains of the usual piers dividing them into three and two aisles respectively, it would seem in the highest degree improbable that the same builders should have built the church, the largest and architecturally most important part of the group, in a single compartment; and the view quoted above is antecedently probable. The tracery and outer jamb mouldings may very well have been inserted in the older walls; in the same way that the small Late Perpendicular window in the west end has been inserted at a long subsequent period, the original circular arch yet remaining over the inner jambs. Tracery, or the remains of it, occurs only in the windows of the choir, the rest being lancet lights; and the tracery, as far as we can judge by the drawings given of the small portions that remain, appear to be of comparatively late date.

The east end of the church exhibits a simple and dignified elevation, with two stories of triple lancet openings. The west doorway is deeply moulded, and is a fine specimen of late twelfth-century work, as also the doorway in the west wall of the transept, probably formerly opening into the cloister.

Mr. Phillips, who is author of both the letterpress and the lithographic illustrations, has taken much trouble in rendering his work complete, and acknowledges assistance from several gentlemen whose names are well known in archæology. The illustrations, to a small scale, are effectively drawn; we should, however, prefer uniformity in the illustrating process, and not a mingling of pen-drawing with lithographic chalk; which latter medium, besides, is more suitable for illustrations of a "popular" type than for giving what architectural students must look for. We must point out also that to the architect such a monograph cannot be regarded as complete without sections of the mouldings to at least quarter-size; the little sections given here are of no use, except just as explanatory of the drawings.

A *facsimile* is given of the principal masons' marks found on the building, which the writer observes, "correspond with masons' marks of various dates found in different parts of the world, as a comparison with the extensive series collected by Mr. Godwin would show." He adds that "the very practical and common-sense workmen who wrought the stones for this abbey left other marks than these little incisions, and on such fragments as the sections of the clustered columns are to be found the lines by which, seven hundred years ago, the stone-cutters squared and set out their work."

EDINBURGH.

HITHERTO the district police-stations in this city have been buildings of no architectural character. A new station for the west has just been completed from the designs of Mr. Robert Moreham, city superintendent, which is an exception to this rule. It is situated at the east end of Torphichen-street, and consists of three stories; the sky-line is broken by a main gable terminated by a foliated thistle, gablet windows with appropriate finials, and a square tower having a steep slated roof culminating in a louvre ventilator. The doorway of the police-office is semicircular-arched and moulded, and the entrance to the fire-engine house is similarly treated on a larger scale. The building cost about 4,000*l.*, and is a picturesque erection, in which a good effect has been produced without unnecessary expenditure.

In George-street a large frontage has been screened off, and operations have been commenced for the erection of new offices for the Union Bank of Scotland, designed by Mr. David Bryce, R.S.A.

In London-road a large and handsome church is approaching completion for the United Presbyterian body, from the designs of Mr. Harforth, of which more hereafter.

The Osborne Hotel, at the west end of Princes-street, is now completed. It is an imposing pile, of French character, the details executed in compo; it will not add to the architectural reputation of the city. We understand that the Clarendon and Waverley hotels, both in Princes-street, are to be overhauled and rendered more convenient within, and more attractive outwardly; at present they consist merely of adjoining dwelling-houses, having no distinctive character.

The University authorities have invited the following gentlemen to compete for the new Medical Class-rooms:—Mr. David Bryce, Messrs. Cousin & Lessels, Messrs. Peddie & Kinnear, Messrs. Wardrope & Reid, and Mr. Robert Anderson. Mr. Bryce has invariably declined to compete, and has not made the present an exceptional instance. The other gentlemen have, however, intimated their willingness to do so.

In the first instance, small sketch drawings are to be submitted, accompanied by explanations, but without coloured perspectives, and must be lodged on or before the 1st of December next. The cost, exclusive of fittings, is limited to 70,000*l.* The committee express a preference to fitness and propriety of style rather than to elaboration in detail, and call attention to recent improvements in buildings of a similar nature. The accommodation required for the various classes is as follows:—Anatomy, 4,000; chemistry, 400; physiology, 250; pathology, 200; materia medica, 250; surgery, 250; practice of physic, 250; midwifery, 200; medical jurisprudence, 200; with a retiring-room attached for each professor. There are likewise required, an anatomical theatre, with a superficial area of 1,800 ft.; an anatomical museum, 112 ft. by 40 ft., and 42 ft. high, with two galleries surrounding the area; a dissecting-room, 100 ft. by 40 ft., and 30 ft. high, with cellarage attached; a museum of chemistry, an apparatus-room, and other accommodation for that department, &c. The University hall must provide accommodation for 2,000, the ground-floor to be an open area, with movable seats, and three sides of the hall to have galleries with fixed seats, the fourth side to be occupied by a platform, with accommodation for 300 persons.

The site of the building is, as we have already informed our readers, at the entrance to the Meadows, and adjoining the new Infirmary. It comprises the space presently occupied by Park-place, Teviot-row, and Park-street. It is open on all sides, the aspects to the west and north being particularly good for architectural display. To the eastward there is a block of buildings, forming part of the west side of Bristo-street, which is very contracted at this point, the removal of which would greatly enhance the effect of the new buildings, besides being a great improvement in other respects.

EAST LONDON RAILWAY.

THE East London Railway is not, like many that have been constructed before it, a means of communication by railway between one locality and another as termini, or to bring a particular place, or district, into communication with some great railway system. It is at present, in so far as opened, a merely local line, but when it has been completed, according to the intentions of its promoters, by the execution of the works that are now being carried out, it will be a continuous through route between the great railway systems on the north of the Thames, and others on its south bank, particularly the South-Eastern, and the London, Brighton, and South Coast, and will command, doubtless, in the future a large mineral and other traffic.

The portion of the line now open is from Wapping to Newcross, and to the Old Kent-road Station of the South London line, by which there is communication with Peckham, Denmark-hill, Brixton, Clapham, South Lambeth, Battersea, and Victoria Stations. The junction between the East London and the South London lines was amongst the first portion of the works completed. It will be seen that by change of carriages this route gives travellers by the East London access to the London, Chatham, and Dover lines at Loughborough.

At present the East London line has its terminal station closely adjoining that of the Brighton Company at Newcross. By changing from the one station to the other, the East London passengers have, of course, access to the Crystal Palace, and to all stations on the Brighton line.

The works now in progress, and that are in an advanced state, at the southern portion of the East London system, are up and down junctions with the South-Eastern and the Brighton and Newcross Stations. These branches are in all something over two miles, and include a crossing under the main line of the South-Eastern, which has four lines of rails near the Newcross Station. This has been effected without any interruption to the heavy local and through traffic of the South-Eastern other than the exhibition of a green, or caution, flag at the place where the works are being carried out. This line, the reader may be reminded, is the one most used by Imperial, Royal, and other distinguished personages travelling between England and the Continent. The South-Eastern road is carried on flanged girders of wrought iron, 12 in. deep, and placed at 5 ft. between centres. The head-room for the trains of the East London passing beneath is about 14 ft. The finished works on the East London line include two other crossings, of a similar character, under the main line of the South-Eastern, and a crossing under the main joint lines of the Brighton and South-Eastern *viâ* Redhill.

The East London line, as has been stated, is already open between Newcross and Wapping. From Newcross to Deptford-road Station, or nearly so, the works are of an ordinary character.

From that point the works become very heavy, in the retaining walls of the Grand Surrey Docks, which are closely skirted by the line, and in the descent, by covered-way and tunnel, to Rotherhithe Station, at the southern entrance to the old Thames Tunnel, which has been utilised for the railway route. Rotherhithe station platform is at the bottom of a great well, that is, bounded by high battering walls on each side, that are assisted in retaining their positions by cast-iron struts of enormous weight, resting on the piers on each side. The old tunnel needed but little done to it beyond the laying of the rails. The original well and stairs at Wapping that led to the tunnel still remain.

Beyond Wapping, the works, which are very heavy, are in active progress. The northern end of the line will be a junction with the Great Eastern, and an entrance to the Liverpool-street new station of that company. From this point the East London Company will have access to the Metropolitan system, and, through union with the Great Eastern Company with the Great Northern, Midland, London and North-Western, and other companies, having communication with all parts of England and of the United Kingdom.

Sir John Hawkshaw, F.R.S., is engineer-in-chief of the East London; Mr. W. Hunt, his courteous and efficient resident engineer; and Messrs. T. & C. Walker, are the contractors.

ARCHÆOLOGICAL SOCIETIES.

Leicestershire Archæological Association.—The general meeting of the members of this society has taken place. The first day was devoted to a gathering in the old Guildhall, under the presidency of the Mayor, Mr. W. Kempson. At the morning meeting a local paper, contributed by Mr. T. North, on "the Pates of Eye, Kettleby, and Lyesonby," was read, and an inspection of the five old churches of Leicester,—St. Martin's, St. Mary's, St. Nicholas's, All Saints', and St. Margaret's,—was made.

This inspection being completed, the party wended their way to the Wellington Hotel, where a number sat down to a cold collation, presided over by the Mayor. At four o'clock a gathering took place at Wyggeston's Hospital, the ancient characteristics of which were explained by Mr. Thompson, who afterwards conducted the party to various objects of local antiquarian interest, including the Jewry Wall, the Castle, and Trinity Hospital.

The Public Evening Meeting was held in the Town-hall, under the presidency of the Mayor, at eight o'clock, when the attendance was very limited.

Mr. James Thompson began with reading a paper on the Rolls of the Mayors of Leicester.

Wednesday was devoted to an excursion to the churches of Syston, Rearsby, Gaddesby, Ashby Folville, Twyford, Queenborough, and Barkby, the guide being Mr. M. H. Bloxam, of Rugby.

Wiltshire Archæological Society.—The annual congress of the Wiltshire Archæological and Natural History Society has taken place at Devizes. The opening meeting was held in the town-hall, in the presence of a numerous assemblage. The president for the year, Mr. Gabriel Goldney, M.P. for Chippenham, presided; and the company included Sir John Awdry, the Ven. Archdeacon of Wilts, the Right Hon. E. P. Bouverie, the Rev. Canon Jackson, the Rev. C. Awdry, the Mayor and Corporation of the Borough, the Rev. A. C. Smith and Mr. W. Cunnington, the honorary secretaries, and many of the principal residents in the district. The Rev. A. Smith conveyed to the meeting the great regret felt by the Marquis of Lansdowne that his absence from the country would prevent his attending the congress. Mr. Smith then read the annual report, which congratulated the members upon the fact that this year the Society had attained its majority, having been established twenty-one years. The present muster-roll contained 341 names, and not a few of the members were archæologists whose fame extended far and wide. The Right Hon. E. P. Bouverie moved the adoption of the report, and, while admitting that beyond being a member of this Society he had little or no claim to be considered an archæologist, said he nevertheless felt a great interest in the preservation of those ancient monuments in which Wiltshire abounded. He remembered to have seen while travelling across the county of Wilts, some forty or forty-five years ago, parties of men engaged in breaking up the noble stones of the Druidicial Temple at Avebury, for use in the repair of roads, and partly owing to the operations of such societies as this, that spirit had almost entirely passed away, and there was a strong desire in these days to maintain those monumental mysteries, as many of them were, they being interesting links between us and the early occupiers of our land. Canon Jackson, Mr. H. A. Merewether, Q.C., and others, also spoke; and the president (Mr. Goldney) delivered an address on archæology. The business of the meeting having closed, the company visited the new museum and library, which were formally opened. The collection of objects was well arranged. In the evening there was a *conversazione* in the town-hall, after dinner at the Bear Hotel.

SOIRÉES AND LECTURES AT NORTHAMPTON.

THE DEEP WELL—ROMAN CATACOMBS—FLINT IMPLEMENTS.

A VERY spirited and highly successful series of *soirées* and lectures to inaugurate the Northampton Museum, with music, experiments, works of art, and other exhibition displays of interesting objects, has been carried out by a committee appointed for the purpose; and the local *Herald* and *Mercury* give full reports of the proceedings.

One of the papers was on the local deep well, by Mr. A. Haviland. The lecturer, in commencing, drew attention to the fact of the prevailing drought during the last six months having brought to the minds of the people the necessity of understanding well-sinking. Taking the whole year, nearly 10 in. were in defect. He then drew attention to the different sources of water within the neighbourhood of Northampton. In the first instance, he stated that there were drift gravels which were to be found in pockets of the Upper Lias Clay. This was one source. In high grounds especially these patches of drift gravel were the abundant source of water—a superficial, and, therefore, an easily attainable source by the Abyssinian pump. This cropped out in conjunction with gravel and clay, and supplied the villages with water, though not persistently. The next source that we had was one we found at Kingsthorpe; first, where the water was got at in the Marlstone, and through which it percolated until it came to the Estuarine Clay which underlaid it. This was another source of their water-supply. The next source was the Northampton sand, which cropped up beneath the Estuarine Clay. When present, it became also a great recipient of rain. This lay on the Upper Lias Clay, and was the great source of water throughout the county. It was the original source of the water that supplied the old conduit of the town in the fifteenth century. This, the lecturer pointed out, was a supply which was so failing in consequence of the drought. He then said that if such a town depended entirely upon this third source, they would practically be without water; that, foreseeing this, the Water Company had, in 1897, procured a supply from the Marlstone, which lay underneath 153 ft. of the Upper Lias Clay. He pointed out how this Marlstone in Northampton and the neighbourhood within ten or twelve miles cropped out upon the surface on the high ground, and there received the rainfall; and it was from this abundant outcropping of the Marlstone in Leicestershire and Rutland, and a great portion of Northamptonshire, that the Marlstone water-source was derived.

"A Visit to a Roman Catacomb," by the Rev. Dr. Scott, was the subject of another lecture. The rev. gentleman commenced by saying that owing to the destruction of the early Christian records under Diocletian, the Roman catacombs were invested with a peculiar interest, as the chief source of information concerning the history of the age of martyrs, from a Christian point of view. The Catacombs were the burial-places of the early Christian dead. There were to be found the bodies of the martyrs, in sepulchres specially designed for their honour. Here were S. Flavia Domihilla, niece of Vespasian, with her chamberlains, SS. Nereus and Achilles. Here was martyred St. Sixtus, and here rested St. Lawrence, his deacon, likewise a martyr. Here were hidden the early Bishops of Rome. Here the early Christians assembled at the martyrs' tombs for the celebration of the Holy Eucharist. Here St. Jerome tells us he was wont to spend the Sunday afternoon with his youthful companions,—visiting these resting-places of the early Christian heroes. In fact, here we found the roots of the great tree of the Christian faith. The Greeks would admit none to high political office who had not duly cared for their fathers' tombs. The Romans, from the same feeling, granted perfect liberty of choice for all to bury the dead where and as they pleased, provided the spot was sufficiently removed from the city, and a few other similar legal arrangements complied with. Thus the Christians were enabled to bury the martyrs where they suffered. Hence we have the tomb of St. Peter on the Vatican, of St. Paul on the Ostian Way, of S. Priscilla, and others contemporary with the Apostles. In course of time this resulted in a vast underground necropolis, extending, if all the galleries were in one line, certainly to a length equal to that of Italy, and not improbably to a distance of a thousand miles. During 410 years from the time of the Apostles 6,000,000 ordinary Christians and martyrs were here laid to rest. After that period the Catacombs were visited as shrines by the liberated Christians. In course of time the martyrs' bodies were removed to churches especially built for that purpose above-ground. Then after Rome's troubles at the hands of the invading barbarians, the catacombs remained hidden and almost unknown for 700 years. They were partially rediscovered in the sixteenth century, and were in our day being for the first time completely investigated.

Flint Implements.

Mr. S. Sharp read a paper on early flint implements, which is of especial interest with respect to what we had occasion to say two or three years ago as to the true nature of the glacial era, as one simply of *extreme summers alternating with equally extreme winters*,—an idea long entertained by us, and to which we were lately much pleased to find that Professor Owen distinctly and explicitly adheres. The lecturer, in commencing, said, he should divide his short discourse into three sections. In the first he should state the when, the where, and under what circumstances these implements had been found. In the second he should address reasons for the conclusion that they were really of man's handiwork, and state the uses to which they were applied. In the third he should attempt to convey an idea of the extreme remoteness of the period at which the fabricators of these flint implements had lived. The first record of the finding of an unpolished worked flint hatchet was in the British Museum. In the catalogue of Sir Hans Sloane's Museum (upon which, in 1853, the British Museum was founded) was a description of a "British weapon" which had been "found," as the catalogue states, "with an elephant's tooth, opposite Black Mary's, near Greyes inn lane." This weapon (which our present knowledge told us was fashioned long before there was a "Britain" at all) was still in the British Museum. In the 13th volume of the "Archæologia" was an account of "flint weapons" found at Hoxne, in Sussex, in gravel containing fresh-water shells and bones of elephants. Several of these "flint weapons" were still preserved in the Museum, and many others from time to time, up to a recent period, had been collected from the same spot. About 1830, the Rev. Mr. M'Enery, a Roman Catholic clergyman, explored the caverns near Torquay, known as Kent's Hole, and found, in the lower bed, numerous worked flints, associated with the teeth and bones of the mammoth (or woolly elephant), the woolly rhinoceros, cave bear, hyena, &c. This cave had since been thoroughly explored, and Mr. McEnery's discoveries fully confirmed and greatly amplified. In 1833, Dr. Schmerling, of Liege, discovered in caves, in the valley of the Meuse, in Belgium, in places 200 ft. above the river level, bones of man and worked flint, "surrounded by teeth of elephant, rhinoceros, bear, hyæna, and horse." Numerous flint implements had been found in other localities in Belgium. In 1841, M. Boucher de Perths, of Abbeville, discovered in the gravel of the Somme valley, at Menchecourt, near the city, a worked flint associated with bones of extinct mammalia; and subsequently many at various places in the same valley, associated with teeth of the mammoth, and bones of other extinct mammals. He published a work, in which he attributed the worked flints to antediluvian man, and concluded that they and the huge mammalian remains had been entombed together by the deluge. In 1858, the attention of Dr. Falconer, F.R.S., the great English naturalist and geologist, was directed to the subject; and, at his suggestion, a

party of eminent geologists and antiquaries visited Abbeville and Amiens, inspected the collections of the French geologists, examined the gravels in which the implements and animal remains had been discovered, found many of the flint implements and elephants' teeth *in situ*, verified the conclusions already arrived at as to the real association in time of the implements with the elephants, and assigned to them an antiquity incomparably greater than that assigned them by the French philosophers. Since that time, such flint instruments had been found in abundance in the valley of the Lark and Little Ouse, in Norfolk and Suffolk, and in smaller numbers in the drift of the Reculvers Cliff in Kent, at several places in South Hampshire, in the Isle of Wight, near Salisbury, and in many other localities in this country too numerous to refer to now. Numerous cases in France occurred, containing, not only the handiwork of man in flint associated with the remains of extinct animals, but human skeletons and bones, and with them fragments of coarse pottery and numerous worked objects in bone, ivory, and cervine horn. The extinct species of animals found in this country, in association with flint implements, included the mammoth, or woolly-coated elephant (at least one-third larger than any living elephant), another still larger elephant, a woolly rhinoceros, another species, a large hippopotamus, the cave bear, cave hyæna, cave lion, the *machairodus*, or sabre-toothed lion, an immense deer (*megaceros*), a huge ox, bison, &c. Besides these, many animals extinct in this country, but occurring in other parts of the world, such as the musk-buffalo, the reindeer, the arctic bear, the grizzly bear, &c., had been found in the same deposits. If it was asked, what were the uses and objects of these early flint implements, he should certainly say that some forms of them were used as weapons of offence in the shape of missiles, some as hatchets or hafts of handles, others as hatchets used naked in the hand; some large ones, it had been thought, were used for rudely tilling the soil; some evidently for scraping skins. The simple flint flakes were knives and scrapers. The remoteness of the times in which the human fabricators of these flint implements lived, depended greatly upon the questions as to whether these objects of human handiwork were really contemporary with the animals with whose remains they were found stratigraphically associated, and as to the remoteness of the period in which those animals existed. The age represented by the association of man with extinct animals had been termed by Sir John Lubbock, F.R.S., the Palæolithic, or ancient stone age, and this age was divisible into two periods of successive remoteness, marked in the latter period, as compared with the former, by a great advance in manipulatory skill, indicating a commensurate advance in the direction of civilisation. These were classed as the river Gravel or Drift Period (the earlier) and the Cave Period (the later of the two). To establish the coeval coincidence of man and the mammoth in the earlier,—the Drift Period,—was not so easy of proof as in the Cave Period. With reference to the latter, indeed, their contemporaneity was indisputable. In beds of the Gravel Period no human bones had yet been discovered, but so universal had proved the stratigraphical association of the great extinct mammals, that it had become an accepted expectation that where the one had been found the other would be found also. In the Woodwardian Museum, at Cambridge, were the skull and horns of a bison, of an extinct and immense species, found in the gravel near there: when found, the cranium was fractured, and in the fracture was a flint implement, such as those he now exhibited, proving three things,—the presence of man; the use by him, at any rate, if not the manufacture, of the flint implement; and the contemporaneous existence of man and the extinct beast. Positive proof was offered in the caves of the south of France that man and the mammoth and other extinct animals did really and truly live at the same time. It had been stated that in these caves skeletons were associated with flint implements, coarse pottery, and objects wrought in bone, ivory, and cervine horn. The last included domestic instruments, needles, harpoons, &c., wonderful incised drawings upon bone of various animals, a reindeer horn carved into an easily-recognised figure of a reindeer, and, most wonderful of all, upon a fragment of a mammoth's tooth, an incised drawing, by these cave men of the Glacial era, of the living mammoth itself, which no Palæontologist could fail to recognise, and which no naturalist could mistake for a representation of a now existing elephant.

THE STRIKE IN THE SLATE QUARRIES.

SIR,—I have recently spent some days in the slate-quarries in Carnarvonshire, Merionethshire, and Montgomeryshire, where the closing of Lord Penrhyn's great works excited universal interest, and although, since my return to Town, the dispute has been "patched up," it is still entitled to more public discussion than it has hitherto received out of Wales.

It is estimated that the number of skilled slate-makers and rockmen in the Bangor district does not exceed 6,000, of which number about one half were employed at Lord Penryhn's quarries; the quarries at Festiniog, Machynlleth, &c., employing about 3,000 more: so that the supply of slates for the United Kingdom, besides the large and increasing export trade, depends upon the industry and skill of about 9,000 men; and so great is the demand for the produce of their labour that it is necessary to book orders at the quarries for long periods before delivery is required,—often as long as eighteen months in advance,—and yet, in the face of so prosperous a trade, with prices steadily increasing under the unerring laws of supply and demand, some 3,000 men are allowed to abandon the largest slate-quarry in the world, on grounds which appear to be singularly insufficient to the unprejudiced inquirer. The system of working a slate-quarry is by piece-work,—the men generally working in gangs or crews of three or four,—at prices for the slates produced in accordance with printed lists; but, as the formation of rock is more or less favourable for the production of slates, when a certain piece of rock or "bargain," as it is termed, is let to the men, a payment is agreed upon, in addition to the price-list of slates, in order to rectify the inequality in the formation of rock; and this payment, called "poundage," is regulated according to the appearance of the formation. Thus a bargain may be let without any poundage if the slate rock be of easy split, and with horizontal foot joints of the necessary division for the different sizes of slates. This would be known as "a first-class bargain"; and at the printed scale of prices three men would make 20*l.* to 25*l.* per month; but if the joints be irregular, the split more difficult, and in consequence the slates produced reduced in number by such defects, poundage, ranging from 2s. 6d. in every pound's worth of slates made up to 40s. or 50s., is added to the prices. Most quarries contain different strata of slate-rock, varying in their colour, spots, stripes, joints, size of blocks, &c., and these peculiarities make it difficult to fix the proper poundage.

Having fixed the terms upon which a bargain was let, one would naturally suppose that whatever the result of the working, the men would be paid the amount earned according to agreement; but, in Lord Penryhn's quarry, while no guarantee existed of a minimum rate of wages, a maximum was fixed, no man being allowed to receive more than 5*l.* for a month's work, although he produced slates which entitled him to 8*l.* One can scarcely imagine a more vicious system, demoralising to the men, and opposed to the interest of the proprietor; and yet this formed one of the substantial grievances of the men. When the price-lists upon which the producers are paid are compared with the prices at which the slates are sold at the quarries, it seems utterly incomprehensible that work so productive should be stopped for a moment, on such apparently insufficient grounds: for example, the fixed price for making slates of 24 in. by 12 in. has been 25s. per 1,200 for a long period; whereas, according to price-lists before me, the charge at the quarry, for the same article, was, in September, 1872, 192s.; in September, 1873, 195s.; in January, 1874, 200s.; and I believe that a further advance of 15 per cent. is to be made on the 1st proximo. So great is the demand for slate that there appears to be no prospect of any reduction in prices, and yet Lord Penrhyn has refused to guarantee his workpeople the moderate wages of 30s. per week to quarrymen, and 25s. to labourers, on the ground that it would be a premium on idleness, while he has found no such fault with the system of muleting the men of part of their poundage if, by their industry and good fortune, they earned what he considered was too much!

The dispute in Lord Penrhyn's quarry has not been limited entirely to a question of wages, although other grievances have indirectly arisen out of the system of regulating the poundage,—thus, charges of bribery and favouritism in letting the bargains have been made, and persecution of men who did not vote according to Lord Penrhyn's views at the last election, are matters of complaint. Then, Lord Penrhyn has much offended the men, and excited very strong feeling against himself, by stating that although wages at his quarry were lower than at others, his workmen enjoyed the advantage of low-rented cottages, infirmary, cheap schools, clothing, and medical clubs, to which his lordship made large contributions. This parade of charity as a reason for giving low wages caused great indignation, and the men retort that 1s. per month being deducted from them to support the sick funds, it is their own money that has been expended; and they ask for a statement of accounts, being of opinion that 150*l.* per month out of their wages may have proved a source of profit to the quarry. As to the cottages, the men also allege that the improvements they have themselves made, and the rent they have paid, fully remunerated his lordship. The managers of the quarry became very unpopular with the bulk of the men, probably to some extent as the natural result of their having to work on a vicious principle; at all events, the men refused to go on under their control, and demanded their dismissal. The necessity for perfect confidence between the managers and the men is apparent to all who consider the peculiar nature of the terms made in letting the bargains; and the men were determined either to have some guarantee of earning "a fair day's wage for a fair day's work," or a change of managers.

The use of slate increases so rapidly as its value is recognised as a substitute for stone, marble, &c., that the public is deeply concerned in the present struggle. Not only is slate entirely superseding tiles for roofing purposes, but enamelled chimney-pieces of elaborate design, slabs for cisterns, window-cills, copings for walls, ornamental flooring-tiles for passages, conservatories, flower-boxes, &c., doorsteps and landings, ridge-rolls, tombs, bagatelle and billiard boards, school slates, and a multitude of other articles are in demand on account of the great cheapness and durability of the substance and its capability of being carved and worked into almost any form.

Doubtless a vast amount of capital has been uselessly expended in opening slate quarries that have proved to be worthless; but, on the other hand, a good, well-managed quarry is probably among the greatest prizes a capitalist can secure. To see, therefore, such a property as Lord Penryhn's quarry at Bethesda idle, is among the most remarkable "sensations" of the season. The proprietors of the quarries still at work rapidly absorbed the men on strike, and taking advantage of Lord Penryhn's being *hors de combat*, raised the prices of slates, which have been hitherto ruled pretty much by his lordship.

The quarrymen appear to be a very industrious, peaceable class, the vast majority members of religious denominations, devoting their leisure to the practice of music and other rational pursuits. I never heard better choral singing nor more effective instrumentalists than the workers in slate-quarries. They live on the simplest fare,—bread, milk, potatoes, and a little tea is often all that can be afforded; in fact, to quote an article from the *Carnarvon and Denby Herald*, of the 15th ult.:—"Food of proper nourishing qualities cannot be procured for a family of five or six children for 3*l.* or 4*l.* a month, and the rising generation in the neighbourhood of Bethesda stand in the most imminent danger of being permanently crippled, because their bodies cannot be properly developed on the strength of bread and tea or milk and potatoes, which are almost the only articles of food procurable by the inadequate wages paid at the great quarries."

GEORGE OFFOR.

Steam Pumps.—We notice that Messrs. Hayward, Tyler, & Co., of Whitecross-street, have been again successful with their "Universal" steam pump in an open competition held at Lille, the centre of manufacturing industry in the north of France, the "Comité Agricole de Lille" having awarded them a handsome gold medal. These pumps appear to find increasing favour.

VAULTING AS A MODERN EXPEDIENT.

THE circulation of the last number of the Sessional Papers of the Institute of Architects, containing so much as was read of the recent prize essay on vaulting, and the discussion thereupon, suggests the consideration of the practical relation of the subject to contemporary architecture.

The subject is, as an enthusiastic speaker in the discussion observed, a "magnificent" one, regarded as (what it undoubtedly is) the principal key to the evolution and constructive basis of one of the greatest styles of architecture. Considered in its bearing on the past of architecture, no subject in architectural study can be more interesting, or better repay investigation. In following it up, we trace out the difficulties of the Mediæval builders, and become more intimate with their processes of construction than by any other study; and we are met face to face by some of the most knotty and intricate problems possible in masonry construction.

Much has been said, and too much can hardly be said, as to the grand effect realised by the architects of the vaulted naves of the Middle Ages, and the triumph of architectural expression over material, in the air of lightness and spontaneous growth imparted to these really weighty and massive structures. As examples of successful overcoming, or evasion and concealment of difficulties, they are beyond praise. But can the Gothic vault really be regarded as a model of constructive skill, as an example of how the thing ought to be done, or only as an instance of how it may be managed?

As the means of bringing an arched roof to bear upon points and not upon large surfaces, and thus economising abutment, the gradual substitution of the Gothic interpenetrating vault for the Roman wagon vault, was a move entirely in the direction of engineering economy of material. And the substitution of the pointed arch for the stilted or segmental arches, and makeshift twists of the Early Romanesque vaulting, was a further step both in construction and design, striking away at once a host of difficulties in the way of accommodating the vaulting ribs to different proportions of plan and to the varying lengths of transverse and diagonal ribs. But if we examine further we find the carrying out in detail less logical and precise; and it is noticeable that every fresh paper or work on the subject launches us anew amid the difficulties of adjustment of the vaulting ribs at their springing, and the impossibility, even with the pointed arch, of getting ribs of different spans, and therefore different curvatures, to agree together at setting out, or to come home amicably on to the impost. What the pointed arch does accomplish is this,—it removes the necessity of domical treatment in the vault, and, introducing a varying radius for the vaulting-ribs, enables the builder at least to keep springings and heads respectively at the same level, instead of resorting either to stilting or doming. But the pointed arch ribs of different radius take different curves in their progress from impost to ridge, and until they are so far separated, above the springing, that the eye no longer regards them in relation to each other and to the abacus, they are not susceptible of symmetrical treatment and arrangement. It is singular that this manifest defect has been so little spoken of as a defect. In every essay on the subject, as we observed, this difficulty appears, and it is pointed out how the Mediæval builders either ignored it, and let their vaulting-ribs break away from each other irregularly and at varying heights above the abacus; or how, as suggested in Mr. Eagles's paper, concealed compound curves might have been used in the diagonal ribs to bring them into symmetrical relation with the rest; or, as Mr. Phené Spiers suggested in the discussion, the difficulty was got over by setting back the diagonal ribs on the abacus. But it does not seem sufficiently recognised that all this (with all reverence for the mediæval builders) was very make-shift work, and was really getting out of a difficulty by a mere rule of thumb, and not by any logical or consistent system. It was a kind of cooking of the construction to make it seem to do what in reality it mathematically could not do. And this is not solving the problem. When a system of vaulting ribs of the same section springs from a symmetrically-planned abacus, it should be *de rigueur* that they should meet it and spring from it symmetrically. No Greek architect would have been content to leave such a problem in the condition in which the Mediæval builders left it. It is true that in a large proportion of vaults the springing, being high up and foreshortened to the eye, is so little regarded that it may become practically a very secondary matter, but in those lower structures where the springing of the ribs from the abacus is brought near to the eye, it is always awkward in appearance, and has a look of accident about it, very unsatisfactory. This defect was really got over, and the problem solved, when the Tudor architects invented the system of vaulting known as fan tracery, in which every rib springs from the abacus at equal angles with its neighbours, and with the same radius of curvature. This entire solution of the mechanical and mathematical problem at this point by the Tudor architects was referred to and enlarged upon long ago by able critics, yet in the paper and discussion at the Institute on the occasion referred to, the merit of these latter builders on this head was all but ignored, and the reader of the paper finished with a quotation from Mr. Street specially intended as a rap at the late vaulters, and as a plea for the use, in modern buildings, of the simple early quadripartite vault, as the best and truest. This is not a logical way of looking at it. It is perfectly true that the Tudor vault erred, perhaps on the side of over-richness of elaboration, certainly in the sense of not being, in its most elaborate examples, treated with architectural truth, the ribs being carved as ornaments when the actual rib construction was really almost in abeyance. This was a defect, a bathos of style which no one is obliged to imitate, and which detracts seriously, no doubt, from the architectural merit of the later Gothic vaults. But it must nevertheless be remembered that these roofs do exhibit the only complete solution of an important problem in the design of vaulting lines and surfaces, and that the older vaults, though grander, more masculine and severe in style, all the while shirked a problem which ought to have been solved. And we do not think any modern architect should plume himself on the construction of vaulting until he has shown that, without imitating the artistic defects of the fan roofs, he can combine with a severer and simpler vault (if he likes) a mathematically correct solution of the problem of symmetrically springing the ribs. It is a poor excuse to say that what was good enough for the Mediæval builder is good enough for us.

It should be borne in mind that there is still a problem to be solved in realising the homogeneous character which the vault should give to a building,—that of the external roofing. The time-honoured practice of placing a timber roof over the vault to protect it is another makeshift, and, despite its all but universality, we have no business to rest there. If vaulting is extensively employed again, it rests with modern architects to devise a method of finishing it externally so as to dispense with a timber shed over it, to render it homogeneous in character and at the same time satisfactory in external appearance. This should not, we think, be impossible; we have cement, tiles, roofing-flags, other means for devising external impervious covering; and an attempt to realise this desideratum might lead, in the most natural manner possible, to some of that novelty in architectural treatment which is so often asked for, but which will only arrive as the spontaneous result of new developments of construction.

THE SCOTTISH DOMESTIC STYLE.

IT has been alleged that Scotsmen adhere with remarkable tenacity to their natural peculiarities. This is undoubtedly the case as regards the domestic architecture of the country. The tourist in Scotland, whichever way he directs his steps, will find mansions new and old of a character not found elsewhere. He may indeed when journeying in France have cast his eyes on similar structures, for the Scottish baronial style (as it is called) is based upon that of the French château, resulting from the alliance and intercourse which subsisted between the two countries when Scotland was a separate kingdom. But there is a rugged boldness about the Scottish mansion not found in its French prototype; it has a character of its own, influenced doubtless by the difference of climate and material, and the comparative poverty of the people.

In Scotland, as elsewhere, the Renaissance took a firm hold for a time both in town and country, and a considerable number of mansions was erected there in the Classical manner, principally from the designs of the Messrs. Adams; but these it is generally admitted are out of harmony with the surrounding scenery, and latterly some of them have been transmogrified into the national style. Amongst these may be mentioned Panmure Castle, the residence of the Earl of Dalhousie, and Kinnaird Castle, the seat of the Earl of Southesk. This affords proof of the pliability of the style; it is essentially Gothic in character, although the pointed arch is rarely found, and that only tentatively in the earliest examples.

It is a mistake to suppose, as some do, that internal comfort is sacrificed to external effect in these mansions; if instances of such exist, it is the fault of the architect and not of the style. We doubt if anywhere there will be found more convenient and comfortable residences than those erected from the designs of Mr. David Bryce, R.S.A., who is *facile princeps* in this line.

Those turrets which form so picturesque a feature are not mere useless appendages, but form snug retreats, useful as dressing-rooms, wardrobes, &c. The gables rise in steps, the most natural and common-sense mode of construction where stone is used, saving a considerable amount of labour, and producing an effect equal at least to that of a moulded coping, to prepare for which the angles of the steps must be cut off. The style readily yields itself to any inequality in the ground level; the basement does not require to be screened off, but when left to declare itself gives emphasis and substantiality to the superstructure. The architect having abundance of durable stone at command, stone often of a hard and intractable nature, makes his detail large and forcible rather than refined; he corbels out oriels, and runs bold string-courses along the wall-surface, producing an effect of massive strength combined with variety of outline. Even when a more picturesque style is adopted, unless it is treated in a massive and vigorous manner it is not satisfactory. The half-timber manor-house, which is so charming amidst the hills of Surrey, seems here to be flimsy and out of place. The cold blast which sweeps over the moor, the chilling mist which creeps down the valley, and the fierce driving sleet of winter, are enemies which must be guarded against. When properly treated, the modern mansion is no sham castle; it is but a reminiscence of the past, replete with comfort and suitable to the climate.

The tower which generally forms the culminating point of the pile, need not be furnished with a machicolated parapet: such are still built, but when they are, do not seem so much out of place as they do in a town-hall or a court of law. The flag-staff, again, is no mere ornamental appendage; it is the simplest of telegraphs, where the habitations are widely scattered. When the flag is fluttering in the breeze the neighbours know the house is occupied, and may then wend their way over hill and dale if they wish to visit the occupant, and nowhere is the visit of a friend more heartily welcomed than in those turreted and picturesque mansions.

In towns, many examples of the style exist. The features are there modified to suit the circumstances. Towers and turrets are rarely found, except when the house is quite detached, and in some instances a piazza is formed on the street level. It is but recently that the style has been re-applied to street architecture, but it is now in great favour, especially in positions where the gradients are steep; in such positions a series of gables rising one above another forms a much more happy combination than that of a number of horizontal cornices abruptly breaking off at short intervals. In the old town of Edinburgh several new streets have been erected in this style, with more or less success; there is a tendency to overdo this kind of thing and to crowd in too much detail, giving a restless character to the design. In some instances new detail has been used, and the style admits of being freely treated. It can be applied to many purposes besides a dwelling-house; the new Royal Infirmary of Edinburgh is being carried out in this style, and, so far as erected, is effective without being expensive.

Architectural Association Prizes.—The prize as encouragement for architectural sketching has this year been awarded to Mr. G. D. Oliver, of 14, Southampton-street, Fitzroy-square. The drawings, &c., submitted by Messrs. W. Talbot Brown, A. W. Hennings, and S. Vacher were honourably mentioned.

HOSPITALS THAT KILL.

THAT there are such places our readers know full well. As we have again and again asserted with reference to many existing institutions, patients would have a better chance in a wretched tent under a hedge, with the poorest attendance, than they have within the costly building overlooked by the highest surgical skill, and waited on night and day by attentive nurses.

At the recent Congress of the British Medical Association in Norwich, Dr. Michael Beverley read a paper on Hospital Hygiene, with references to the Norfolk and Norwich Hospital in its Past, Present, and Future, which deserves such extra publicity as we can give it. In this paper Dr. Beverley proved that during the past ten years influences have been at work in the Norfolk Hospital which have given rise to a very large amount of that most fatal of septic diseases, pyæmia, and that it has increased the proportion of deaths after operations and injuries to an extent which, large as he felt it to be, he had failed to realise, until he had made these investigations, "and which although beyond their present control, brings little credit to the surgeons, whose skill, however great, is frequently neutralised by causes which, in his opinion, *may*, and indeed *must*, be counteracted in the future, if hospitals are to continue fit receptacles for the wounded, either accidental or surgical."

The reader thus concluded:—

"We have been almost entirely obliged to give up operating in the hospital, and the corporation has placed at our disposal for this purpose, for the last six months, a small iron hospital, where most of the operations have been performed; but even there erysipelas has proved fatal in a case of excision of breast for cancer, brought about, in my opinion, by an overcrowding under one roof of nothing but surgical wounds at a time when, from the unusual heat of the weather, the temperature in this small iron hospital was almost unbearable. Here, then, are the facts:—A pyæmic-stricken hospital, centenarian in age, original form and sanitary arrangements good, but spoiled by subsequent additions. Its requirements for the reception of surgical patients and serious accidents of all kinds still greatly increasing. Such is the problem I ask you to help us to solve. Time will not permit me to ventilate my opinions at further length on this part of the subject. I content myself with urging that, whatever is done, there should be *no additions to the present building*. Mr. Erichsen states, 'There is one remarkable circumstance connected with the age of hospitals: that new buildings added on to old hospitals become more unhealthy than the original building.' I do not think it will be necessary to pull the hospital down and build an entirely new one, although, if we had the funds, such would probably be the wisest course. This has been done at Lincoln, where it was found (after years of attempts to root out pyæmia, by renewing the interior of the hospital, improving ventilation, &c.; in short, taking the same steps as we are now taking at Norwich) that nothing but demolition would remove it; that, as the writer on the subject puts it, 'Just as the cattle plague has to be stamped out by the pole-axe, so has the infection of a pyæmic hospital to be destroyed by the pick' (Erichsen). I am not quite prepared to recommend the 'pick,' as we have a very large proportion of chronic medical cases, and a few acute ones, always under treatment in our hospital. Let it be retained, then, for these; but I will suggest that it be restored as much as possible to its original form; let the other causes which produce overcrowding and tend to its unhealthiness, be removed; such as the reception of a large body of out-patients twice a week, and more or less every day, into the centre of the building. Let the dead-house and its belongings, now connected with and close to the wards and corridors, be removed to a safe distance. Let there be a more careful attention to the ventilation of the lower corridors at night, which for many months of the year supply the wards with night air; and I think by these, and a closer attention to the simple hygienic rules on the part of nurses and officers, the old building may be retained with safety. But what is to be done for the surgical patients? If for them you build a new surgical hospital on the recently-acquired three acres of land, with all the improvements and appliances which sanitary science and knowledge can produce, I fear you will not remedy the evil. For a time your new building will probably give you an improved death-rate after wounds and operations, but I venture to think that in due course septic troubles will arise, as they necessarily must in any building constantly and exclusively used for surgical purposes. My proposition is to have a series of one-storied and separate buildings, dotted over the ground which has been bought for the extension of the hospital. That these buildings should be in sufficient numbers to admit of one for each sex, being kept always empty, so that after the plan recommended by Billroth, no ward should be used for more than a month or six weeks in succession. It should then be emptied, carefully cleaned and left open, the furniture and linen well aired and washed; to this end the beds should be limited to eight, with two small separation-rooms to each for very bad cases, as by so limiting the number, sufficient can be discharged to allow the wards to be easily emptied and filled again in turns, and for this reason also the new patients should be always placed in the ward last cleaned. In addition, I think, there should be a separate building into which any case of erysipelas or septic disease can be at once removed and isolated. The plan of detached buildings is, I am aware, open to many objections from the administrative point of view, as regards hospital economy and management, but these are difficulties which can be overcome; and even granted that many inconveniences must exist more than in the present compact and comfortable edifice, still it is our first duty to adopt such plans in hospital extension as shall give to those who entrust their lives to our care the best chance of recovery, and the greatest freedom from the risk of any dangers likely to be caused by the hospital itself; in fine, it is only right we should take care that the advantages we offer are not more than counterbalanced by the sacrifice of life from diseases caught within its walls, and aggravated by its influences. If the plan suggested of *detached* and *isolated* one-storied small buildings, so erected that an unlimited supply of pure air for the inmates is the chief consideration in their construction, and the two rules laid down by Dr. Parkes in his work on 'Practical Hygiene' be carried out: first—'That the sick should be distributed over as large an area as possible, and each sick man be removed as far as possible from his neighbour'; second—'That the sick should be placed in small detached, and perfectly ventilated buildings, so that there is no great number of persons in one building, and no possibility of the polluted air of one ward passing into another': then the Norwich surgeons might again be said not only to acknowledge Nature, but to take her as 'the senior partner of the firm,' and so hope once more to show the same admirable balance-sheet in favour of life, which gained such golden opinions for the Norfolk and Norwich Hospital in the pre-pyæmic era."

In the course of the discussion which afterwards took place, Mr. Richard Barwell could not agree with the advice given, because it must be remembered that hospitals were chiefly charitable institutions, and, valuable as human life was, no more than a certain amount of money could be afforded. For his own part, he recommended that all the additions which had been made should be pulled down and perfect ventilation secured both back and front. There should be only one row of beds to each row of windows.

Dr. Falconer said the great object ought to be to allow the air free access to and egress from the hospital. The system of washing stairs and floors ought to be abolished, and the floors simply dry-rubbed. He also recommended a movable roof, which should be removed periodically, and further that out-patients should be excluded from within the walls of the hospital.

Mr. J. Hutchinson said it was assuming too much to say that new hospitals were free from pyæmia. In the Schleswig-Holstein war, where cottages were converted into hospitals, the doctors had much trouble with pyæmia in the treatment of the wounded, and in the new buildings at St. Thomas's Hospital, pyæmia had made its appearance. Although hospital ventilation was desirable, it had, in his opinion, little or nothing to do with such diseases as hospital gangrene, erysipelas, and pyæmia. Was it not desirable to undertake a special and close investigation as to what were the real causes of these diseases, and the modes of their spreading?

Dr. Beverley, in replying, said, he believed that the presence of septic diseases was due to bad ventilation and overcrowding. He held that if a new surgical hospital were erected, with all recent appliances, there would be good results, but only for a time. He was convinced of the feasibility of his plan of erecting isolated wards on the new ground recently acquired for the Norfolk and Norwich Hospital. The proper material for hospital walls had not yet been determined; but in a ward now being refitted by a private benefactor, he had recommended that the plaster should be stripped from the walls, and Parian cement, polished, used instead,—and this recommendation had been adopted.

The objection raised to the proposal by the first speaker, namely, that valuable as human life is, only a certain amount of money can be afforded for hospitals, surely cannot be accepted: better erect no buildings at all than such as become destructive instead of curative.

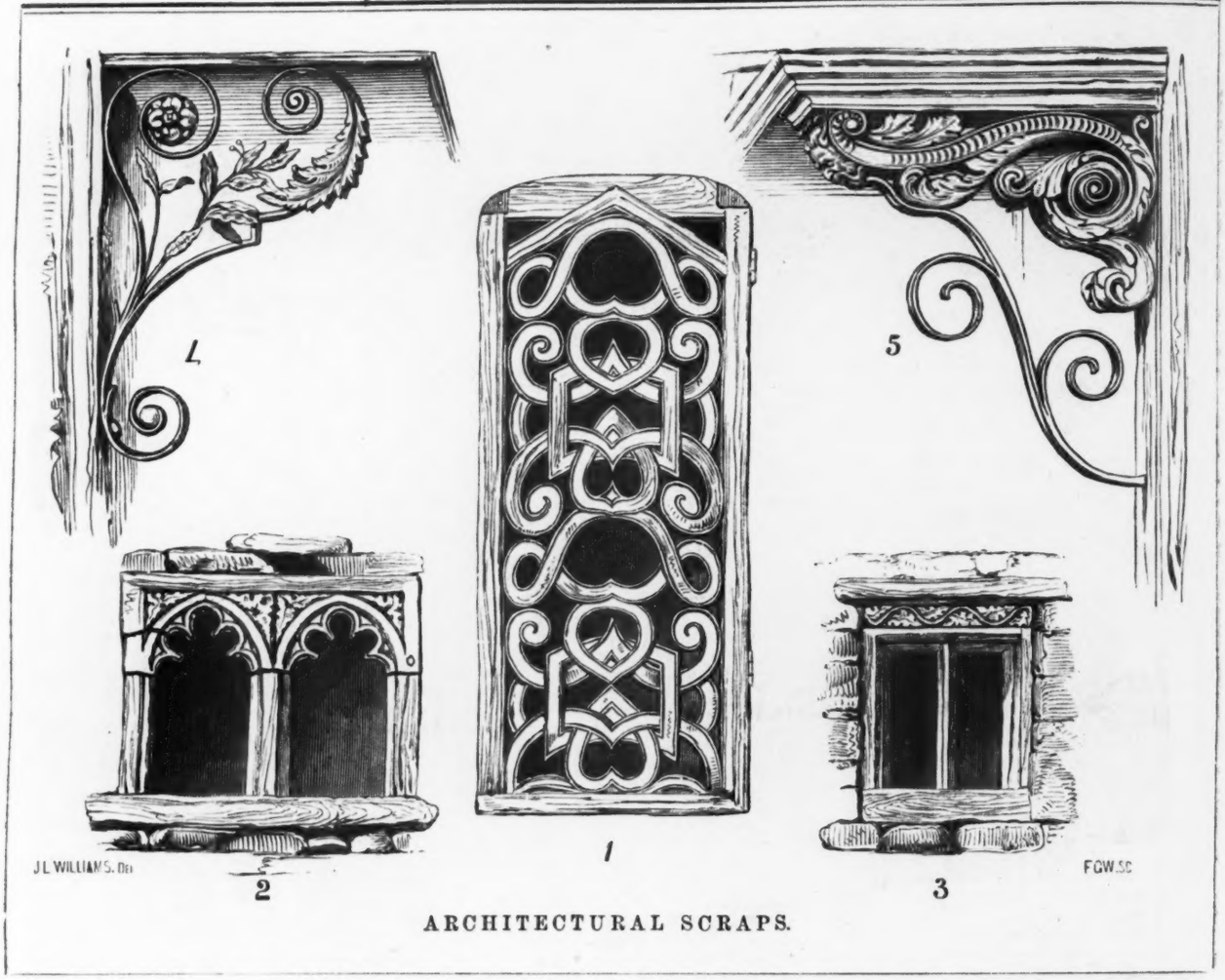
ASSESSMENT OF GASWORKS, BRISTOL.

THE Bristol United Gas Light Company are the owners and occupiers of the Gasworks which supply Bristol with gas. The property of the company extends over a district which embraces an area much larger than the boundaries of the ancient city of Bristol. The works or stations are three in number, and are situated at Canon's Marsh, Avon-street, and Maudlin-street, the two former being large works, the latter a small one, comprising, in fact, little more than one gas-holder. The mains and pipes of the company extend throughout the whole of the parishes comprised within the boundaries of the ancient city as well as into other parishes in the Bedminster and Clifton Unions.

When the new valuations were made in all the parishes, the company's assessments were very considerably increased, and the company appealed against the new assessment in every case. Much negotiation resulted, and in the end it was referred by mutual agreement to the arbitration of Mr. John Clutton, of Whitehall-place, London, to determine and state in his award the total gross estimated rental and rateable value of the entire rateable property of the said Bristol United Gas Light Company, and also to apportion the same among the various parishes. The inquiry was commenced on the 18th day of November, 1873, and was completed on the 14th day of January, 1874. The late Mr. Horace Lloyd, Q.C., and Mr. F. Meadows White, Q.C., appeared for the appellants; and Mr. Field, Q.C., and Mr. Norris, Q.C., for the respondents. Mr. Edward Ryde, of Parliament-street, Westminster, valued the works for the year ending the 30th day of June, 1871, at 10,959*l.*, and for the year ending the 30th day of June, 1872, at 7,007*l.* Mr. Townsend, the secretary to the company, and Mr. Fiddes, the engineer, were called to prove facts connected with the working of the company. Mr. Henry Finlay, engineer to the Surrey Consumers' Gas Company at Rotherhithe, and Mr. William King, engineer to the Liverpool United Gas Light Company (the largest provincial company), were called to prove that the various data upon which Mr. Ryde's valuation was based were correct. Mr. John Foster, architect, of Bristol, proved the structural value of many of the buildings. Mr. Thomas Hawksley (past president of the Institution of Civil Engineers) proved that he had turned his attention a good deal to gas and its manufacture; that he was acquainted with a very large number indeed of the gasworks in England, and that he had also turned his attention to the principles and practice of rating gasworks; that he had seen Mr. Ryde's valuation, and did not differ from Mr. Ryde in general principles. He agreed with the greater part of the valuation, but there were a few little things in which, as might be expected, different gentlemen would hold different opinions, the amounts, however, did not vary very much in the general working out. Mr. Henry James Castle, of Chancery-lane, London, valued the property for the parishes at 20,412*l.* for the year 1871, and at 15,849*l.* for the year 1872. Mr. Alfred Penny and Mr. George William Stevenson proved engineering facts connected with gasworks. Mr. William Sturge valued the property for the year 1871 at 17,683*l.*, and for the year 1872 at 13,828*l.* Mr. Ashmead and Mr. Thomas confirmed Mr. Sturge's valuation.

The arbitrator has awarded, for the year 1871, 14,048*l.*; for the year 1872, 10,445*l.*

The Vendome Column.—The restoration of this historical monument is the work of two Paris founders, MM. Maillet and Thiebault. The cost of the restoration will be from 250,000f. to 300,000f.



ARCHITECTURAL SCRAPS.

ARCHITECTURAL SCRAPS.

THE jottings represented above are not without suggestiveness.

No. 1 shows a wooden door, of pierced work, *temp.* Queen Elizabeth, from the hermitage at Pontefract, Yorkshire, in which, tradition says, Peter, the hermit, of Pomfret, lived in the time of King John.

Nos. 2 and 3, Two windows from an old building at Minehead, Somersetshire, now used as a tannery. The woodwork is of great solidity, fastened with pegs. The arched windows are in the upper story, whilst the square-headed one is on the ground-floor.

Nos. 4 and 5, Door-hoods or canopies from Woodstock, Oxfordshire. In No. 5, the truss or bracket is of wood, boldly carved, with secondary support of iron. No. 4 is entirely of wrought-iron; the foliage and scroll-work being worked with great freedom of handling.

TOURNAY CATHEDRAL.

BELGIUM does not possess a finer example of Gothic architecture than the choir of the cathedral at Tournay, and it is strange that so very little should be known as to the history of this very remarkable work; even the date of its erection is involved in doubt. Hovelant, a local historian and archæologist, says that this choir was commenced in the latter part of the eleventh century! Schayes, that it was begun in 1110, and completed in 1242; Kugler, that it was completed in 1338. Now none of these dates are in accordance with the architecture of the building, which, from the great similarity it bears to the choir of the cathedral at Beauvais (erected 1240–1250), is probably a building of the latter half of the thirteenth century. There is no probability of the Belgian church being of an earlier date than the French one, because if we compare contemporary buildings in the two countries we find that the French were half a century in advance of the Belgians.* The choir of Tournay Cathedral is so far superior in point of detail and construction to anything else in Belgium, that it may be doubted whether, after all, it was not the work of a French architect. There is an entire absence of that heaviness of detail and clumsiness of construction so apparent in Belgian buildings of the thirteenth century, nor are any of the "bungling" contrivances by which the Mediæval builders in Belgium overcame their difficulties to be seen in this church. Here the arches set down properly on to the capitals, and the capitals are set properly on the shafts or columns, and the whole work seems to have been carefully set out before it was erected, a thing not to be found in any other early church in Belgium.

The choir of Tournay is of grand dimensions; it contains seven bays in length, exclusive of the apse. The aisles are very large, and have shallow chapels opening into each bay; the entire length, exclusive of the lady-chapel at the east end, is 190 ft.; the height to the vaulting, 111 ft.; and the width, exclusive of the chapels, 100 ft. The arrangement of the chevet is singular: the centre compartment alone opens into a chapel, the other four compartments are bowed out into apses. The effect of this is to give great space in the part of the aisle which surrounds the high altar; and as this space is available for congregational purposes, it is a remarkably good arrangement for High Mass and other grand ecclesiastical functions, especially when, as is the case at Tournay, there is a very solid rood-screen at the west end of the choir.

With the exception of Beauvais no more daring exploit in the way of construction was ever attempted in the middle ages than the erection of the choir of Tournay; of course it was too daring. The Gothic architects succeeded in supporting a stone vault upon the smallest possible substructure, but they could not succeed in supporting it upon nothing, and hence we find that at Beauvais they were obliged to subdivide the arches and add supplementary piers, and at Tournay the buttresses have had to be enlarged, and the whole building tied up with iron rods. It is said that these ties were not added till the time of Louis XIV.; but fractures and settlements seem to have taken place even before the work was completed, for in one of the small apses, forming the chevet, a window is about 8 in. larger at the bottom than at the top. No settlements, however, seem to have taken place lately, and the opening of the triforium some thirty years ago, which had been blocked up during the last century, has had no bad effect upon the stability of the building, while it has added greatly to its beauty. There are several peculiarities in the design of this choir which we will now point out. In the first place, the piers are not arranged like columns, but are placed with their axes at right angles to the choir like buttresses. Secondly, the triforium, instead of being arranged as a continuous arcade or a series of arches equally subdivided, consists of two Gothic openings of two lights each, with a smaller opening of one light between them. This centre light, in addition to being much narrower than the other openings, is also lower, and the large space above it is pierced by two cusped circles. In the apse, where the compartments are narrower than at the sides of the choir, this central opening is omitted. And thirdly, the clearstory windows, which are very high and lofty, are also singular: they are of three lights, and as the two outer lights are made to coincide with the larger openings of the triforium below, and the centre light with the smaller central opening of the triforum, the centre light is very much narrower than the two outer ones. Outside the effect of this is not satisfactory, but internally, the stained glass has been skilfully arranged so as to subdivide the two larger lights into three compartments each, and thus the awkward look has been avoided.

This choir has been well restored. None of the furniture is old except the rood-screen, which is a magnificent example of early Renaissance work, constructed of marble and alabaster, and covered with sculpture. The high altar is composed of white marble and bronze gilt, and was brought from the now-destroyed church of St. Martin. It is poor in design, and although its material is costly, it looks mean and undignified. The stalls, bishop's throne, and side-screens

* This may be seen by comparing the choirs of Amiens and Brussels, which were contemporary.

TOURNAY CATHEDRAL, BELGIUM.—THE CHOIR: THIRTEENTH CENTURY.

are all unworthy of this noble choir; in fact, the whole of the furniture and nearly all of the monuments were destroyed by the soldiers of the French Republic. A new altar has been put up in the lady-chapel,—it is of stone with an arcaded front, but is too poor for its position. All the windows of the choir and apse have been filled with very rich modern stained glass; and although the colours are a little crude, the windows are excellent in design, and the general effect is decidedly good. We believe these windows are by Capronier; probably a few years will take off the metallic look in some of the colouring.

The transept of the cathedral is a fine specimen of Romanesque work. In very early days the conductor of this journal printed some particulars of the building at that time, and of the various opinions expressed as to the ages of the structure. These will be found in the *Civil Engineers' Journal*.

ARCHITECTURE ON DEESIDE.

SOME years ago Mr. W. Cunliffe Brooks inquired of us the name and address of the author of a competition design which, though unsuccessful, we had published because of its cleverness, and desired to know what we could say for him. We were able to say what satisfied our inquirer, and the following article, which, because of the above incident, we reprint from the *Aberdeen Journal*, sets forth one small part of the result of that introduction. We recall with gratification several similar instances wherein, during the course of our long editorship, a few honest words have served to lay the foundation-stone of good fortune, without the knowledge, even to this day, in more than one case, of the person benefited:—

"We lately had an outing up Deeside, and took the opportunity of visiting a number of architectural works lately executed, or in course of construction, all by one architect,—Mr. George Truefitt, of London; but while we now give a description of these works, be it known that it is not for the purpose of puffing up this gentleman, and we hope, upon future occasions, to give descriptions of works by our own local architects, and which we shall have even greater pleasure in doing than in noticing those by one who is a stranger to us.

Our first visit was to Borrowstone, Kincardine O'Neil,—Captain Hart's residence. Here, some three years ago, Mr. Truefitt altered the old house, adding a new dining and drawing room, some more bedrooms, bath, &c., and joining the new to the old work by a low wing,—*fortunately*, for a fire occurred this spring, and burnt the whole of the old place to the ground, the low building being the means of preserving the new. The rubbish has now being cleared away, and new works are in progress, in the same style as the rooms erected three years ago. We may here remark that, in Mr. Truefitt's buildings, we do not get that horridly cold appearance which we have in our Union-street, where the chief aim seems to be to get every stone as white as possible, and as smooth. He, on the contrary, gets his stones as varied in colour as he can, and, with the exception of the "dressings," the work is as rough as possible,—not rough work, but stones of random sizes, and rough on the face. The result is, that he gets a great variety of colour, and a deal of light and shade, even on a plain wall. The paint of his frames and sashes is of a warm yellowish colour, which adds much to the general effect, and again gets rid of cold appearances.

The second place we visited was Aboyne Castle, the seat of the Marquis of Huntly. Here Mr. Truefitt, about five years ago, pulled down the old kitchen department, which was in a ruinous condition, and erected new buildings in their place, all in granite, with stepped gables, very simply done, but effectively. We notice the total absence of mouldings, everything done being *square* in the edges, and which seems to be the most reasonable way of using granite,—certainly the best way of saving a client's pocket. We have often seen in polished work that square members look better than moulded, and cost nothing at all compared with the latter. We now see the same result in unpolished work.

On the Green, at Aboyne, we noticed that this same architect had just commenced new schools, under the local School Board, and, on examining the plans, we found the same style is intended to be carried out—stones of varied colour, high roofs; and here we may mention that Mr. Truefitt never seems to have a show front to his buildings. He carries the same work all the way round, and distributes his gables, &c., so that his outlines look well from any point of view. We can point out some buildings in a certain great northern city of which we are proud, where we have the cold white granite front, every block as square as possible, while the sides are done roughly with variegated stones; and we have thought to ourselves what a pity they did not mix up the lot together, and use squared ones equally all round, and rough ones equally also. The cost would have been no more, and the effect doubled.

From Aboyne we went to Glen Tanar; and here Mr. W. Cunliffe Brooks's liberality and taste have allowed our friend plenty of scope for his designs in all kinds of works. At the Bridge of Tanar, on a fine rock, is a tower—the entrance lodge of the estate. Here there is no show front: the windows of the different floors are dodged about, so that each front has only about one window; and the stones have been very carefully selected, of various colours, in stages. The lower portion of the tower is well 'battered' down into the rock; a staircase runs up inside one corner, and has a projecting turret at the top, covered with lead. This is one of the most effective buildings we have seen here, while we noticed that there is nothing in it which we could point to as being expensive, as work which was not absolutely needed, or which could have been done at less cost, but all done well and properly. From the tower we pass by the side of the River Tanar till we come to another lodge at the deer fence. This building is square, with roof hipped all ways.

We then pass on to what was a tumble-down old cottage, of one story only. A wing has been added at the end, at right angles to it, and with gable in front. The old part has had a projecting window added, and new frames and sashes. So, with the addition also of some shrubs and flowers, this looks a delightful little cottage. The new wing contains a scullery, &c.; and here, as in all the cottages erected by Mr. Brooks, he has had the water laid on from the hills in pipes, and taken to the sinks, where there are no taps, but the water is always running day and night, a right regal 'constant supply.' The population of Glen Tanar having increased some 50 per cent. since Mr. Brooks landed in it, the consumption of whisky, we presume, has not decreased; but if it be true that less per head is consumed, we presume it must be from Mr. Brooks having done away with the excuse the men had, when at home, of having nothing to mix with the genuine article.

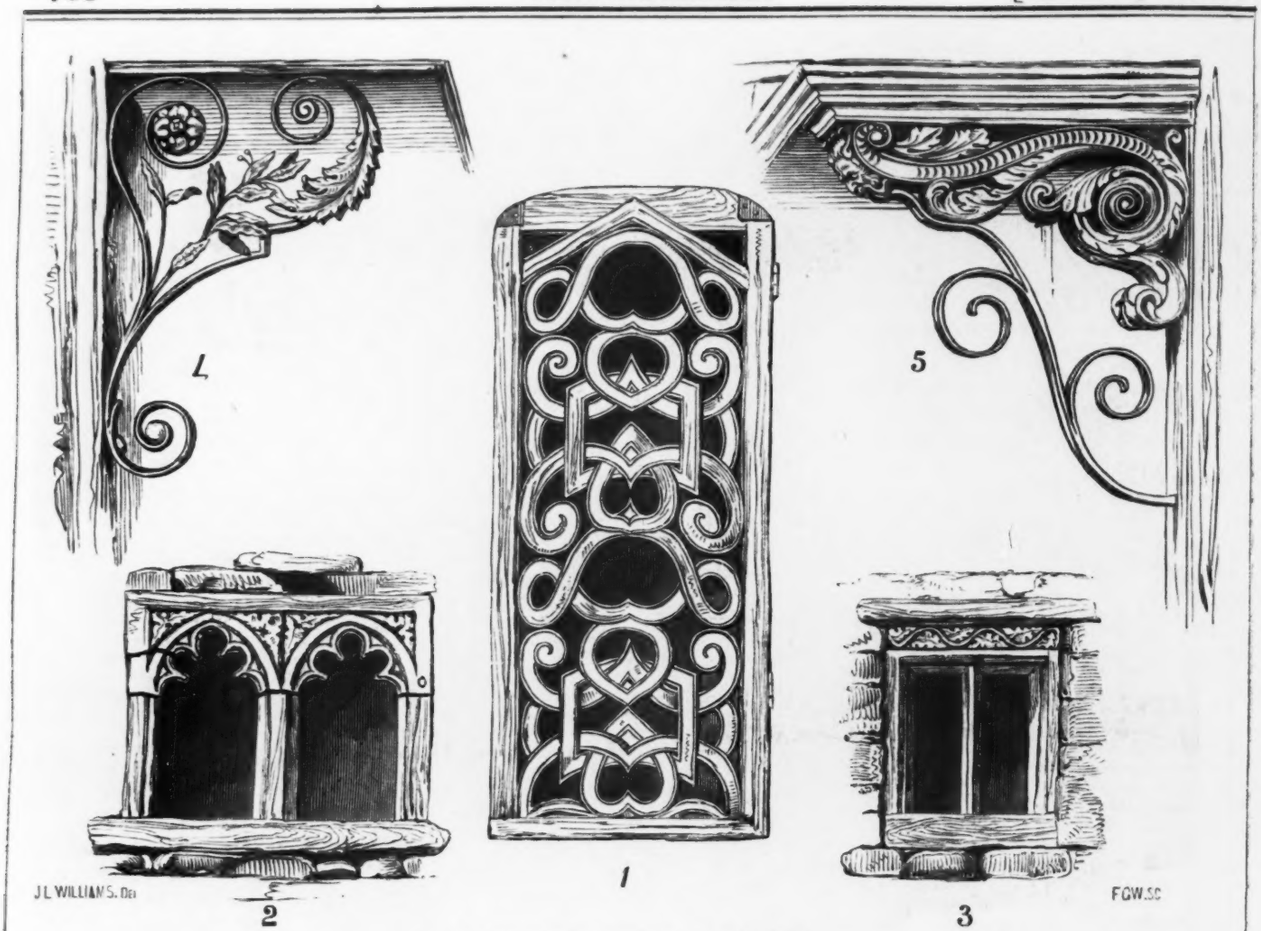
The next place is a house perched up above the road,—the old farmhouse. This was a dreadful blot on the landscape; but, by erecting a picturesque dairy at one end, with low walls, high roof, and verandah, which verandah is carried in front of the house, the whole gets quite right. The dairy-walls all round internally have white glazed tiles above the shelves, with various monogram devices, dates, and subjects relating to dairy matters, all done by the hand. There is also a white marble fountain, with a constant supply of water, in which the butter is deposited. We next reach the kitchen garden, with its high wall, at the corner of which, forming, as it were, part of the wall, is the gardener's cottage. One would expect a couple of rooms here, as only a corner window and a couple of small ones besides are to be seen; but inside we find kitchen, scullery, sitting-room, and three bedrooms, &c., the entrance-door and most of the windows being towards the garden. Mr. Truefitt seems to be great in corner windows. Wherever he can with propriety put one, there we find it; and it not only is most pleasing externally, but it is exceedingly nice inside the room to be able to see in two directions. The corner window to this cottage is a triple one: the corner of the room is cut off, and the window extends also on each side,—so it is a three-light window in three different planes. We now turn off to the stabling, which is very extensive. Stables, loose boxes, coach-houses, harness-room, cleaning-places, &c.,—all with plenty of room and of good height; also two cottages. The stables have water always running, and the buildings are in the same simple but effective style as all the other buildings in the glen. We see the architect likes to keep his walls low and roofs high,—a sure way of getting effect when the proportion is good. Near the stables we find the deer and game larders, with well-stuffed roofs to keep them cool, overhanging eaves, ornamented tiles on the walls, with appropriate devices, birds, &c.; and, as we hear, well stocked, according to the seasons. A little beyond, we come to the dog-kennels, perfect in arrangement, and as picturesque as all the other works, with constant flow of water through the yards for drinking and bathing. We then see two houses, in one of which lives Mr. Brooks's great deer-stalker, and if he does not appreciate his home, where he has plenty of room, his out-of-door seats, and his *water*, he ought to, as we dare say he does. We must now make off to the House itself of Glen Tanar. This originally was one of the little Scotch cottages: two rooms on ground-floor and two attics in roof. The Earl of Southesk then had the shooting for a time, and erected a wing, containing dining-room, drawing-room, and some bed-rooms; but when Mr. Brooks came these were all made into bed-rooms, and in six weeks Mr. Truefitt designed, and had three large reception-rooms built, 30 ft. by 22 ft. each. As time was an object, these rooms were erected of timber, and harled outside; but they have since had an external casing of granite. Another large wing has been built, consisting of servants' hall, bed-rooms, &c., new kitchen department; and the old part of the building has been altered and added to, and made to agree with the new work. We here get a large verandah and porch combined in rustic work, and other bits of rustic work about the building. Internally, the principal rooms have pine dados and panelled ceilings, and we notice in all the bed-rooms ornamental glass of quaint design, every pattern different, and designed by the architect. This glass is in the lower panes of the sashes, and while it gets rid of the usual short white blinds, gives a cheerful effect to the rooms, and adds to the external general effect. Sitting and bed rooms are papered with tinted-glazed plain papers, of quiet tints; they do not, therefore, interfere at all with the pictures, engravings, water-colour drawings, &c., with which the whole of the walls throughout the house are well covered. Our advice to all our readers is to cover your walls with such quiet tints that you may put up your pictures, or old china, or anything you like, and in whatever position you choose. To return to the house: carpets are the same everywhere—sitting-rooms, bed-rooms, and staircase. This adds greatly to the repose of the place. The bed-rooms are purposely all small, but there are plenty of them. One idea was to keep the house as small in appearance as possible. Besides, here in Scotland, when on a visit, a man would rather be in a cosy room, with a fire which will warm it, than in a great barn of a place where a fire makes no impression. Wash-stands and dressing-tables, looking-glasses, and writing-tables, are all designed purposely, and mostly made fixtures. Wherever a shelf or a bracket could be put up, there it is. The beds are so nice, that one does not like to get up, and a distinguished visitor once said they were so comfortable that 'it was worth a guinea a minute to be in one.' Throughout the house, Mr. Brooks has no end of fine antique furniture, ivories, bronzes, &c.; but the charm of the whole is the comfort which prevails everywhere in this his Scottish home, even to his bedroom, which is perhaps the most perfect and delightful room in the house.

From the house we crossed the Tanar by a rustic bridge, and in a few minutes came to the Church of St. Lesmo. There were the ruins here of a small laird's house, with an ancient archway. The latter was left intact, the old walls covered in, and now we find a charming little church. The roofs, seats, choir-seats, and pulpit are all rustic pine, from the forest. Between the rafters the roof is 'powdered' with lead stars, gilt, and with small mirror in centre of each; the floor is granite,—a granite font, the most simple one we ever saw,—and all the windows, which are very small, are filled with ornamental glass. The whole of this little church is most effective, and, of course, is visited by all who go to Glen Tanar.

Making now over the hill, and by the Queen's-road to the Dee, we soon come to a building on its banks, called Faanadarach. This is a fishing lodge, which has just been erected. Here Mr. Truefitt gives us his stepped gables, high roofs, verandah, and bay windows, to his heart's content. It has also a terrace overhanging the river, and a great river wall going right down to the river.

We should have liked to have gone up the Glen and into the Forest, but we found a notice which showed that tourists, if they went without leave, 'might get accidentally shot in the forest,' and as we did not wish our friends to

are all unworthy of this noble choir; in fact, the | that Mr. Truefitt never seems to have a show | &c.; and, as we hear, well stocked, according to



ARCHITECTURAL SCRAPS.

ARCHITECTURAL SCRAPS.

THE jottings represented above are not without suggestiveness.

No. 1 shows a wooden door, of pierced work, *temp.* Queen Elizabeth, from the hermitage at Pontefract, Yorkshire, in which, tradition says, Peter, the hermit, of Pomfret, lived in the time of King John.

Nos. 2 and 3, Two windows from an old building at Minehead, Somersetshire, now used as a tannery. The woodwork is of great solidity, fastened with pegs. The arched windows are in the upper story, whilst the square-headed one is on the ground-floor.

Nos. 4 and 5, Door-hoods or canopies from Woodstock, Oxfordshire. In No. 5, the truss or bracket is of wood, boldly carved, with secondary support of iron. No. 4 is entirely of wrought-iron; the foliage and scroll-work being worked with great freedom of handling.

TOURNAY CATHEDRAL.

BELGIUM does not possess a finer example of Gothic architecture than the choir of the cathedral at Tournay, and it is strange that so very little should be known as to the history of this very remarkable work; even the date of its erection is involved in doubt. Hovelant, a local historian and archæologist, says that this choir was commenced in the latter part of the eleventh century! Schayes, that it was begun in 1110, and completed in 1242; Kugler, that it was completed in 1338. Now none of these dates are in accordance with the architecture of the building, which, from the great similarity it bears to the choir of the cathedral at Beauvais (erected 1240–1250), is probably a building of the latter half of the thirteenth century. There is no probability of the Belgian church being of an earlier date than the French one, because if we compare contemporary buildings in the two countries we find that the French were half a century in advance of the Belgians.* The choir of Tournay Cathedral is so far superior in point of detail and construction to anything else in Belgium, that it may be doubted whether, after all, it was not the work of a French architect. There is an entire absence of that heaviness of detail and clumsiness of construction so apparent in Belgian buildings of the thirteenth century, nor are any of the "bungling" contrivances by which the Mediæval builders in Belgium overcame their difficulties to be seen in this church. Here the arches set down properly on to the capitals, and the capitals are set properly on the shafts or columns, and the whole work seems to have been carefully set out before it was erected, a thing not to be found in any other early church in Belgium.

The choir of Tournay is of grand dimensions; it contains seven bays in length, exclusive of the apse. The aisles are very large, and have shallow chapels opening into each bay; the entire length, exclusive of the lady-chapel at the east end, is 190 ft.; the height to the vaulting, 111 ft.; and the width, exclusive of the chapels, 100 ft. The arrangement of the chevet is singular: the centre compartment alone opens into a chapel, the other four compartments are bowed out into apses. The effect of this is to give great space in the part of the aisle which surrounds the high altar; and as this space is available for congregational purposes, it is a remarkably good arrangement for High Mass and other grand ecclesiastical functions, especially when, as is the case at Tournay, there is a very solid rood-screen at the west end of the choir.

With the exception of Beauvais no more daring exploit in the way of construction was ever attempted in the middle ages than the erection of the choir of Tournay; of course it was too daring. The Gothic architects succeeded in supporting a stone vault upon the smallest possible substructure, but they could not succeed in supporting it upon nothing, and hence we find that at Beauvais they were obliged to subdivide the arches and add supplementary piers, and at Tournay the buttresses have had to be enlarged, and the whole building tied up with iron rods. It is said that these ties were not added till the time of Louis XIV.; but fractures and settlements seem to have taken place even before the work was completed, for in one of the small apses, forming the chevet, a window is about 8 in. larger at the bottom than at the top. No settlements, however, seem to have taken place lately, and the opening of the triforium some thirty years ago, which had been blocked up during the last century, has had no bad effect upon the stability of the building, while it has added greatly to its beauty. There are several peculiarities in the design of this choir which we will now point out. In the first place, the piers are not arranged like columns, but are placed with their axes at right angles to the choir like buttresses. Secondly, the triforium, instead of being arranged as a continuous arcade or a series of arches equally subdivided, consists of two Gothic openings of two lights each, with a smaller opening of one light between them. This centre light, in addition to being much narrower than the other openings, is also lower, and the large space above it is pierced by two cusped circles. In the apse, where the compartments are narrower than at the sides of the choir, this central opening is omitted. And thirdly, the clearstory windows, which are very high and lofty, are also singular: they are of three lights, and as the two outer lights are made to coincide with the larger openings of the triforium below, and the centre light with the smaller central opening of the triforum, the centre light is very much narrower than the two outer ones. Outside the effect of this is not satisfactory, but internally, the stained glass has been skilfully arranged so as to subdivide the two larger lights into three compartments each, and thus the awkward look has been avoided.

This choir has been well restored. None of the furniture is old except the rood-screen, which is a magnificent example of early Renaissance work, constructed of marble and alabaster, and covered with sculpture. The high altar is composed of white marble and bronze gilt, and was brought from the now-destroyed church of St. Martin. It is poor in design, and although its material is costly, it looks mean and undignified. The stalls, bishop's throne, and side-screens

* This may be seen by comparing the choirs of Amiens and Brussels, which were contemporary.

TOURNAY CATHEDRAL, BELGIUM.—THE CHOIR: THIRTEENTH CENTURY.

are all unworthy of this noble choir; in fact, the whole of the furniture and nearly all of the monuments were destroyed by the soldiers of the French Republic. A new altar has been put up in the lady-chapel,—it is of stone with an arcaded front, but is too poor for its position. All the windows of the choir and apse have been filled with very rich modern stained glass; and although the colours are a little crude, the windows are excellent in design, and the general effect is decidedly good. We believe these windows are by Capronier; probably a few years will take off the metallic look in some of the colouring.

The transept of the cathedral is a fine specimen of Romanesque work. In very early days the conductor of this journal printed some particulars of the building at that time, and of the various opinions expressed as to the ages of the structure. These will be found in the *Civil Engineers' Journal*.

ARCHITECTURE ON DEESIDE.

SOME years ago Mr. W. Cunliffe Brooks inquired of us the name and address of the author of a competition design which, though unsuccessful, we had published because of its cleverness, and desired to know what we could say for him. We were able to say what satisfied our inquirer, and the following article, which, because of the above incident, we reprint from the *Aberdeen Journal*, sets forth one small part of the result of that introduction. We recall with gratification several similar instances wherein, during the course of our long editorship, a few honest words have served to lay the foundation-stone of good fortune, without the knowledge, even to this day, in more than one case, of the person benefited:—

"We lately had an outing up Deeside, and took the opportunity of visiting a number of architectural works lately executed, or in course of construction, all by one architect,—Mr. George Truefitt, of London; but while we now give a description of these works, be it known that it is not for the purpose of puffing up this gentleman, and we hope, upon future occasions, to give descriptions of works by our own local architects, and which we shall have even greater pleasure in doing than in noticing those by one who is a stranger to us.

Our first visit was to Borrowstone, Kincardine O'Neil,—Captain Hart's residence. Here, some three years ago, Mr. Truefitt altered the old house, adding a new dining and drawing room, some more bedrooms, bath, &c., and joining the new to the old work by a low wing,—*fortunately*, for a fire occurred this spring, and burnt the whole of the old place to the ground, the low building being the means of preserving the new. The rubbish has now being cleared away, and new works are in progress, in the same style as the rooms erected three years ago. We may here remark that, in Mr. Truefitt's buildings, we do not get that horridly cold appearance which we have in our Union-street, where the chief aim seems to be to get every stone as white as possible, and as smooth. He, on the contrary, gets his stones as varied in colour as he can, and, with the exception of the "dressings," the work is as rough as possible,—not rough work, but stones of random sizes, and rough on the face. The result is, that he gets a great variety of colour, and a deal of light and shade, even on a plain wall. The paint of his frames and sashes is of a warm yellowish colour, which adds much to the general effect, and again gets rid of cold appearances.

The second place we visited was Aboyne Castle, the seat of the Marquis of Huntly. Here Mr. Truefitt, about five years ago, pulled down the old kitchen department, which was in a ruinous condition, and erected new buildings in their place, all in granite, with stepped gables, very simply done, but effectively. We notice the total absence of mouldings, everything done being *square* in the edges, and which seems to be the most reasonable way of using granite,—certainly the best way of saving a client's pocket. We have often seen in polished work that square members look better than moulded, and cost nothing at all compared with the latter. We now see the same result in unpolished work.

On the Green, at Aboyne, we noticed that this same architect had just commenced new schools, under the local School Board, and, on examining the plans, we found the same style is intended to be carried out—stones of varied colour, high roofs; and here we may mention that Mr. Truefitt never seems to have a show front to his buildings. He carries the same work all the way round, and distributes his gables, &c., so that his outlines look well from any point of view. We can point out some buildings in a certain great northern city of which we are proud, where we have the cold white granite front, every block as square as possible, while the sides are done roughly with variegated stones; and we have thought to ourselves what a pity they did not mix up the lot together, and use squared ones equally all round, and rough ones equally also. The cost would have been no more, and the effect doubled.

From Aboyne we went to Glen Tanar; and here Mr. W. Cunliffe Brooks's liberality and taste have allowed our friend plenty of scope for his designs in all kinds of works. At the Bridge of Tanar, on a fine rock, is a tower—the entrance lodge of the estate. Here there is no show front: the windows of the different floors are dodged about, so that each front has only about one window; and the stones have been very carefully selected, of various colours, in stages. The lower portion of the tower is well 'battered' down into the rock; a staircase runs up inside one corner, and has a projecting turret at the top, covered with lead. This is one of the most effective buildings we have seen here, while we noticed that there is nothing in it which we could point to as being expensive, as work which was not absolutely needed, or which could have been done at less cost, but all done well and properly. From the tower we pass by the side of the River Tanar till we come to another lodge at the deer fence. This building is square, with roof hipped all ways.

We then pass on to what was a tumble-down old cottage, of one story only. A wing has been added at the end, at right angles to it, and with gable in front. The old part has had a projecting window added, and new frames and sashes. So, with the addition also of some shrubs and flowers, this looks a delightful little cottage. The new wing contains a scullery, &c.; and here, as in all the cottages erected by Mr. Brooks, he has had the water laid on from the hills in pipes, and taken to the sinks, where there are no taps, but the water is always running day and night, a right regal 'constant supply.' The population of Glen Tanar having increased some 50 per cent. since Mr. Brooks landed in it, the consumption of whisky, we presume, has not decreased; but if it be true that less per head is consumed, we presume it must be from Mr. Brooks having done away with the excuse the men had, when at home, of having nothing to mix with the genuine article.

The next place is a house perched up above the road,—the old farmhouse. This was a dreadful blot on the landscape; but, by erecting a picturesque dairy at one end, with low walls, high roof, and verandah, which verandah is carried in front of the house, the whole gets quite right. The dairy-walls all round internally have white glazed tiles above the shelves, with various monogram devices, dates, and subjects relating to dairy matters, all done by the hand. There is also a white marble fountain, with a constant supply of water, in which the butter is deposited. We next reach the kitchen garden, with its high wall, at the corner of which, forming, as it were, part of the wall, is the gardener's cottage. One would expect a couple of rooms here, as only a corner window and a couple of small ones besides are to be seen; but inside we find kitchen, scullery, sitting-room, and three bedrooms, &c., the entrance-door and most of the windows being towards the garden. Mr. Truefitt seems to be great in corner windows. Wherever he can with propriety put one, there we find it; and it not only is most pleasing externally, but it is exceedingly nice inside the room to be able to see in two directions. The corner window to this cottage is a triple one: the corner of the room is cut off, and the window extends also on each side,—so it is a three-light window in three different planes. We now turn off to the stabling, which is very extensive. Stables, loose boxes, coach-houses, harness-room, cleaning-places, &c.,—all with plenty of room and of good height; also two cottages. The stables have water always running, and the buildings are in the same simple but effective style as all the other buildings in the glen. We see the architect likes to keep his walls low and roofs high,—a sure way of getting effect when the proportion is good. Near the stables we find the deer and game larders, with well-stuffed roofs to keep them cool, overhanging eaves, ornamented tiles on the walls, with appropriate devices, birds, &c.; and, as we hear, well stocked, according to the seasons. A little beyond, we come to the dog-kennels, perfect in arrangement, and as picturesque as all the other works, with constant flow of water through the yards for drinking and bathing. We then see two houses, in one of which lives Mr. Brooks's great deer-stalker, and if he does not appreciate his home, where he has plenty of room, his out-of-door seats, and his *water*, he ought to, as we dare say he does. We must now make off to the House itself of Glen Tanar. This originally was one of the little Scotch cottages: two rooms on ground-floor and two attics in roof. The Earl of Southesk then had the shooting for a time, and erected a wing, containing dining-room, drawing-room, and some bed-rooms; but when Mr. Brooks came these were all made into bed-rooms, and in six weeks Mr. Truefitt designed, and had three large reception-rooms built, 30 ft. by 22 ft. each. As time was an object, these rooms were erected of timber, and harled outside; but they have since had an external casing of granite. Another large wing has been built, consisting of servants' hall, bed-rooms, &c., new kitchen department; and the old part of the building has been altered and added to, and made to agree with the new work. We here get a large verandah and porch combined in rustic work, and other bits of rustic work about the building. Internally, the principal rooms have pine dados and panelled ceilings, and we notice in all the bed-rooms ornamental glass of quaint design, every pattern different, and designed by the architect. This glass is in the lower panes of the sashes, and while it gets rid of the usual short white blinds, gives a cheerful effect to the rooms, and adds to the external general effect. Sitting and bed rooms are papered with tinted-glazed plain papers, of quiet tints; they do not, therefore, interfere at all with the pictures, engravings, water-colour drawings, &c., with which the whole of the walls throughout the house are well covered. Our advice to all our readers is to cover your walls with such quiet tints that you may put up your pictures, or old china, or anything you like, and in whatever position you choose. To return to the house: carpets are the same everywhere—sitting-rooms, bed-rooms, and staircase. This adds greatly to the repose of the place. The bed-rooms are purposely all small, but there are plenty of them. One idea was to keep the house as small in appearance as possible. Besides, here in Scotland, when on a visit, a man would rather be in a cosy room, with a fire which will warm it, than in a great barn of a place where a fire makes no impression. Wash-stands and dressing-tables, looking-glasses, and writing-tables, are all designed purposely, and mostly made fixtures. Wherever a shelf or a bracket could be put up, there it is. The beds are so nice, that one does not like to get up, and a distinguished visitor once said they were so comfortable that 'it was worth a guinea a minute to be in one.' Throughout the house, Mr. Brooks has no end of fine antique furniture, ivories, bronzes, &c.; but the charm of the whole is the comfort which prevails everywhere in this his Scottish home, even to his bed-room, which is perhaps the most perfect and delightful room in the house.

From the house we crossed the Tanar by a rustic bridge, and in a few minutes came to the Church of St. Lesmo. There were the ruins here of a small laird's house, with an ancient archway. The latter was left intact, the old walls covered in, and now we find a charming little church. The roofs, seats, choir-seats, and pulpit are all rustic pine, from the forest. Between the rafters the roof is 'powdered' with lead stars, gilt, and with small mirror in centre of each; the floor is granite,—a granite font, the most simple one we ever saw,—and all the windows, which are very small, are filled with ornamental glass. The whole of this little church is most effective, and, of course, is visited by all who go to Glen Tanar.

Making now over the hill, and by the Queen's-road to the Dee, we soon come to a building on its banks, called Fasnadarach. This is a fishing lodge, which has just been erected. Here Mr. Truefitt gives us his stepped gables, high roofs, verandah, and bay windows, to his heart's content. It has also a terrace overhanging the river, and a great river wall going right down to the river.

We should have liked to have gone up the Glen and into the Forest, but we found a notice which showed that tourists, if they went without leave, 'might get accidentally shot in the forest,' and as we did not wish our friends to

mourn for us quite so soon, or the proprietors of this paper to appoint some one in our place, we thought we would not venture, not having the required pass. We were told, however, that the same architect had been putting up quaint little stables and huts in out-of-the-way places, and that Mr. Brooks, besides thirty miles of deer fencing, had made miles of new roads, and straightened and levelled miles of old ones, also had put up stone bridges, iron bridges, wooden rustic bridges, attended to the water-courses, and, in fact, had done everything that could be done in reason and with good taste.

After passing Dinnet Bridge, we came to Cambus O'May, a lovely spot, and where, through Lord Huntly's exertions, the good railway folks are going to make a station. Here, on the hill, or some distance up, our architect is putting up a capital house for Mr. H. L. Gaskell,—dining-room, drawing-room, library, billiard-room, and lots of bedrooms. There will be three gables in front towards the road, the centre one stepped, and below it a large bay window, with verandah around it.

It will be perceived that we have not merely been describing a number of buildings, but from what we have seen, we have given our readers several practical hints which many may profit by, and we hope they will.

As to the architect who has designed these works, he has to thank his clients for giving him such a capital opportunity of *leaving his mark* on Deeside.

We may add that our townsmen, Messrs. Warrack & Daniel, have been engaged in carrying out the greater portion of the above works; and that Messrs. Burgess & Son, of Aboyne, have done the greater portion of the masonry. Mr. Stuart has been resident clerk of the works nearly all the time at Glen Tanar."

INDUSTRIAL INSTITUTE FOR THE BLIND AT PRESTON.

THE mayor of Preston, on Thursday, 10th inst., opened the new and extensive shop, work-rooms, committee and show rooms, just completed for the "Preston Industrial Institute for the Blind."

The large sale-shop, 30 ft. by 30 ft., is fitted up with every requisite, and has a long counter, about 32 ft., made of the choicest pitch-pine wood, and occupies part of the frontage to Glovers-street; in the rear are rooms for "cane" seating, 29 ft. by 14 ft.; brush-room, 40 ft. by 28 ft., with "pan" room, 18 ft. by 12 ft., and apparatus occupying one end. The remaining portion of the frontage is the residence for the saleswomen, and comprises large kitchen, parlour, and scullery, and three bedrooms on the first floor. The cellars under the whole of the buildings, roomy and lofty, are used as workrooms, storerooms, &c., the largest being 32 ft. by 28 ft. for ship-making; this cellar is constructed in one span. The first floor is approached by two staircases, one for the house portion, and the other for the public in case of meetings or for educational purposes for the blind. Each staircase leads to the large committee-room and secretary's office. These rooms are so constructed that, by removing a sliding partition, one large room for public entertainments can be formed, having separate entrances. Adjoining are lavatories, cloak, and ante rooms.

The main ground-floor front is built of Longridge stone, and is effective in design. In the centre of the building is provided a hose sufficiently long, in case of fire, to extend to all the main rooms. The total cost has been 3,000*l.*, and the money was raised at a bazaar held in April, 1872, when the net proceeds amounted to 3,444*l.* 1*s.* 9*d.*, after paying all expenses. The work has been well carried out by Mr. John Walmsley, of Preston, under the supervision of Mr. T. B. Myres (Messrs. Myres, Veevers, & Myres, architects), Preston.

THE NEW HARBOUR AT ABERDEEN.

THE extension of the North Pier, which has been inaugurated by the Duke of Edinburgh laying the chief stone, will complete the whole work of the harbour improvements at Aberdeen. The total cost of these improvements will amount to about 250,000*l.* In accordance with the powers of the Act of 1868, the diversion of the river Dee was commenced in the following year, and finished two years ago, at a cost of about 52,000*l.*, while the new south breakwater was begun in the spring of 1870, and was concluded towards the end of last year, the cost being about 80,000*l.* The breakwater was erected for the purpose of protecting the end of the North Pier from the full weight of the sea, and to prevent too great an influx into the harbour. It was formed solely of concrete, and is 950 ft. in length and 47 ft. in height. This second extension of the North Pier was contemplated in the Act of 1868, it being considered that without it the harbour was incomplete. The original North Pier, which extended to 1,200 ft. in length, was designed by Mr. Smeaton, the eminent engineer, and constructed according to his plans. The first two sections of the pier were constructed of stone, but the new extension is to be formed of concrete, in similar fashion to the south breakwater. Mr. W. Dyce Cay, the engineer of the commissioners, designed the work, his plan having been approved of by Sir John Hawkshaw and Mr. Abernethy. The foundation for the first 250 ft. consists of a rubble mound, and beyond that distance of fine sand, the depth of water above the foundation being about 15 ft. at low water of ordinary spring tides. Mr. Cay, in his report on the construction, says:—

"It is proposed to form the foundation of the structure by laying down a concrete mound or platform of considerable width. This platform will be formed of bags, each containing about fifty tons of concrete deposited in a liquid state. The deposit of these bags will be effected by the use of a hopper box fitted into the well of a steam hopper barge. The bottom of the box will be formed of two doors opening on hinges, through which the bag will be made to drop. It is proposed to lay down the bags considerably in advance of the upper part of the work so as to allow them time to sink and settle into or through the sand and become consolidated before they are built on. The foundation mound will be formed of three courses or tiers of fifty-ton bags laid longitudinally in the direction of the pier, the lowest tier being about 120 ft., and the upper tier about 55 ft. wide; above them another tier of bags will be laid transversely, each bag being about 40 ft. long after deposit and extending across the work from outside to outside, which will bring up the work to about 2 ft. below low water of ordinary spring tides; above them will be placed one course or tier of concrete blocks averaging twenty tons weight each, which will bring the work up to 2 ft. above low water of ordinary spring tides; from which level to the roadway, a height of about 20 ft., the work will be built of concrete deposited liquid *in situ* in frames in pieces of about 600 tons each, as in the new south breakwater."

By this extension, which it is estimated will cost 44,000*l.*, the breadth of the harbour entrance will be enlarged from 450 ft. to 1,200 ft. Another important improvement about to be executed is the deepening of the entrance, to allow large vessels to leave and enter the harbour during any state of the tide.

RHOSESMOR, NORTH WALES.

THE foundation-stone of a new church in course of erection in this district, on the Duke of Westminster's estate, was laid on Thursday, the 27th of August last, by Mrs. J. Scott Bankes, of Soughton Hall. The church is to be in the Early English style, with nave 24 ft. broad by 60 ft. in length, and a chancel with semi-circular apse, in which are five single lancets. The only entrance is by a south porch, the vestry and organ-chamber being on the north of the chancel. The nave is to be separated from the chancel by a dwarf wall of Halkyn marble; the seven steps to the communion-table will be of the same. The bell-turret is immediately over the chancel arch. The Ven. Archdeacon Ffoulkes preached the sermon in the schoolroom adjoining the site, and the Duke of Westminster laid 100*l.* upon the stone, which bore the following inscription:—"The foundation-stone of the church of St. Paul, Caerfallwch, was laid by Mrs. J. Scott Bankes, on Thursday, 27th August, 1874. Rev. T. Williams, M.A., Vicar of Northop; Rev. T. E. Jones, B.A., curate, Caerfallwch. John Hill, architect, Brighton." The builder is Mr. Wm. Morris, of Rhyl, and the estimate of total cost is 1,300*l.*

INIGO JONES.

MR. JOHN TIMBS, in the course of a communication to the *City Press*, aided by Peter Cunningham's "Life of Inigo Jones," brings together into an agreeable form some of the more salient particulars: as thus,—"With the consent of the king, Inigo Jones began to remove St. Gregory's Church, which stood at the west end of Old St. Paul's, and it would have been soon demolished had the king's affairs been at the time in a more prosperous condition. But it was now Inigo's turn to be annoyed. The parishioners of St. Gregory laid their complaint before the House of Commons, and the Commons sent it on to the Lords, with a declaration appended that the parishioners deserved redress, and that proceedings should be taken against the king's architect for the demolition he had caused. The complaint of the parishioners has not reached us, but the declaration of the Commons contains some curious characteristics of Inigo's manner. He is accused of saying, that he would not undertake the repairs of St. Paul's, 'unless he might be the sole monarch, or might have the principality thereof,'—a harmless charge, indeed, but personally interesting, from the curious confirmation it supplies to the truth of Jonson's satire. The rest is, however, more offensive. He first pulled down a portion of the church, and then threatened, 'that if the parishioners would not take down the rest of it, then the galleries should be sawed down, and with the materials of the said church should be thrown down into the street;' but, finding this of no avail, he further threatened, 'that if they did not take down the said church they should be laid by the heels.'

The declaration of the Commons brought Inigo before the House of Lords, and his answer to the charge was, 'that he was not guilty of the offence in such a manner and form as the declaration expressed.' Inigo gained time in this way, but the division was against him, and the great architect not only saw his noble work of reconstruction at a standstill, but the very stones he had quarried and conveyed to the City made over to the parishioners of St. Gregory's, for the rebuilding of their church. (Dugdale's 'St. Paul's.' Second edition. 1716.)

The Last Years of Inigo Jones's Life.—The last of Inigo's works was the church of St. Paul, in Covent-garden, at the consecration of which, by Bishop Juxon, the architect was present. 'This church,' says Elmes, 'is the only specimen of the true Vitruvian Tuscan ever known to have been executed.' Jones lived fourteen years longer, but the Civil War diverted men's thoughts and means from the peaceful employments of architecture, and found for the king and his nobility other and sterner occupations than superintending squares or rebuilding palaces. The stones quarried for St. Paul's were taken, we have seen, to rebuild St. Gregory's; Whitehall was left unfinished; Greenwich was a mere fragment of a large design; and the masons and workmen in the squares of Lincoln's-inn and Covent-garden took to arms, and fought for King or Commons, as interest or inclination led them. Poets, actors, and engravers were alike thrown out of their usual occupations. Davenant, the Poet Laureate, became Lieutenant-General of Ordnance under the King; Winther, Governor of Farnham, for the Parliament; while Robinson, the actor, Hollar, Peake, and Faithorne, the engravers, and one still greater, Inigo Jones himself, were taken with arms in their hands at the siege of Basing. (Carlyle's 'Cromwell,' 2nd edition.)

The last twelve years of Jones's life were clouded with anxieties and disappointments. He was not only imprisoned, but fined for his loyalty. His office of surveyor was at the best but nominal; for he was neither employed as surveyor nor paid as one. But he had saved money, which in those perilous times he was at a loss how to preserve. There were others in the same difficulty; and Inigo, united with Nicholas Stone, the sculptor, buried his money in a private place near his house in Scotland-yard. That he had all the fear, which Pepys in a similar situation so well describes, it is not too much to imagine; and he had need for alarm. The Parliament published an order encouraging servants to inform of such concealments, and as four of the workmen were privy to the deposit, Jones and his friend removed it privately, and with their own hands buried it in Lambeth Marsh.

Jones had now survived the friends to whom he was indebted for his advancement; the poets with whom he had been associated; and the patrons to whom he owed his appointments. He had lived to see King Charles beheaded in the open street before his own banqueting-house at Whitehall; Ben Jonson and Chapman at rest in Westminster Abbey, and the churchyard of St. Giles-in-the-Fields; and the Earl of Arundel, and both the Earls of Pembroke, William and Philip, gathered to their ancestral vaults. Grief, misfortune, and old age, at last terminated Inigo Jones's life. He died at Somerset House, in the Strand, on the 21st of June, 1652, in his 79th year; and on the 26th of the same month was buried, by his own desire, by the side of his father and mother, in the church of St. Bennet, Paul's Wharf, where a monument of white

marble, for which he left 100*l.*, was erected. It stood at some distance from his grave, and was destroyed in the Great Fire of 1666. It is to be wished that Wren, when rebuilding the church, had rebuilt the monument.

Vandyck and Jones were friends, and the architect sat to the painter for at least two noble portraits. Vandyck and Inigo were asked together to the dinners of the Painter Stainers' Company, as appears by an entry in the Company's book,—an honour which was considerable, and looked upon as such.

Inigo lived in Scotland-yard, was a Roman Catholic, and paid periodical fines to the overseers of the poor of St. Martin's-in-the-Fields, for the privilege of eating flesh in Lent. The necessity that rendered the privilege requisite is unknown; but that he had his ailments may be gathered from a prescription, written with his own hand at the end of his companion *Palladio*.'

IMPROVEMENTS IN SHOREDITCH.

IT appears that the improvements in Shoreditch, the Act for which was passed upwards of two years ago, are at once about to be proceeded with. In answer to a question at the meeting of the Shoreditch Vestry, it was stated that with regard to the improvement to be effected by the setting back of the houses opposite the North London Railway Station, the cost would be about 150,000*l.* The freehold interest had all been acquired, and notices were immediately about to be served on the occupiers, and it was expected that the whole of the property would be down, and set back in about twelve months from October next. The Willow Walk improvement included the formation of an entirely new street. Its cost had been estimated at 270,000*l.*, and it was fully expected that the site of the new street would be entirely cleared by Christmas, when the formation of the street would be at once proceeded with. By Lady-day, 1875, there was every reason to believe it would be open for traffic.

SOUTHPORT WINTER GARDENS AND AQUARIUM.

THE winter gardens, aquarium, and pavilion at Southport are now just approaching completion, after an expenditure of about 100,000*l.* There are, under one roof, an aquarium, second, it is stated, to none in the kingdom; a band pavilion, capable of seating 2,000 people; a promenade adjoining, 170 ft. long by 44 ft. broad, with light verandahs and terraces running the entire length outside; a reading-gallery, supplied with all the chief daily papers circulating in London and the northern counties, as well as the principal monthly and quarterly periodicals; another part devoted to chess, draughts, and similar games; and a conservatory or winter garden at the other end.

These winter gardens and aquarium have been built by a limited company, many of the shares being held by the principal inhabitants of the town. The site is in the centre of the town, with a sea frontage of some 370 yards, and bounded on the north side by Coronation-walk, and on the east by Lord-street. The entire area is about nine acres, which has been laid out, from designs by the architects, by Mr. Thomas, the head gardener to the company. The gardens facing the sea are laid out with especial care, so as to form sheltered walks in boisterous weather, and, although not covering more than four or five acres, they appear much more extensive; cool sheltered caves, grottos, and ornamental rock bridges are features in the grounds. The winter garden proper is between the building and Lord-street, and is sheltered from the prevailing west and south-west winds.

There are two entrances to the grounds—one for pedestrians only, at Coronation-walk, leading from the Esplanade; the other, which is the principal entrance, is in Lord-street, and consists of two stone lodges, with gates between. The carriage-porch, at the west of the building, is an elaborate piece of ironwork, by Messrs. Rankin & Co., of Liverpool, ironfounders. From this point visitors will enter by a staircase, 15 ft. in breadth, and leading to the promenade above, and the aquarium below. The main staircase, indeed, is in the centre of the building, which in outline resembles a double cross—the band pavilion being at one extreme, the conservatory at the other, and the promenade between. In the aquarium and conservatory concrete has been used with success, and extensively, notably for finished staircases, halls, arches, and pillars. This work has been carried out by Messrs. Smith & Fawke, of Birkdale. The whole of the timber is pitch pine, and the roofs are all open-timbered, stained, and varnished. The contractors for this work were Messrs. Haigh & Co., of Liverpool. The entire building is heated with hot water, by Mr. Massinger, of Loughborough. The plastering, plumbing, gasfitting, and painting, have been done by Messrs. Leech, of Bury; the stonework by Mr. Halsall, of Southport; and the brickwork by Mr. Lamb. All the works have been designed and carried out under the superintendence of Messrs. Maxwell & Tuke, of Bury, the resident clerk of works being Mr. Foster. The only decoration in the way of stone figure carving is observable around the outside of the pavilion, figures representing the progress of art and music being arranged around the coping.

The principal hall of the aquarium has moulded columns and groined arch roof. No light is admitted direct into the hall without passing through tinted glass, or being reflected through the twenty-three tanks along the sides. Each of these tanks is now filled with specimens from the deep sea, including conger eels, cod, wrasse, monkfish, soles, plaice, skate, ray, spiney and other lobsters, king crabs from North America, octopus, a collection of spiney and other crabs, whiting, whitebait, anemonies, and a collection of various species of dogfish. The whole of this department of the undertaking has been superintended by Mr. M. H. Reed. The water is kept pure by constant circulation. Under the principal conservatory there is a reservoir, which is kept filled with 300,000 gallons of sea-water, exclusive of that in the tanks, which themselves contain from 150,000 to 200,000 gallons. The store-tanks are divided at two levels. The water is first pumped from the lower to the higher one, and from thence it circulates by its own gravity through the whole tank system, the jets which pass the water into each being of sufficient force to carry with them a current of air. To do this work of pumping there are two engines of eight-horse power each, capable of throwing 8,000 gallons per hour, and three other pumps throwing 2,000 gallons per hour each, while in addition there are air-pumps for circulating warm or cold air through the aquarium. The whole of the machinery is in duplicate.

A STRIKE FOR HEALTH.

THERE'S hope at last for the workmen, who
Are striking to obtain
Water to drink, and decency, too:
Oh! may they strike amain!

Though wars have stain'd our history's page,
Plagues work a deeper line;
Thousands have died in every age,
In workshop, mart, and mine.

The monarch's palace, the baron's hall,
Suffer'd betimes by stealth;
But peasants and craftsmen, one and all,
Had neither home nor health.

The lowly hinds were serfs on the soil,
Who lived in huts and caves;
And still in this age many who toil
Dwell in their living graves.

Our craftsmen, and building workmen, too,
Who work'd for power and wealth,
Have gasp'd for water and air, and knew
They died athirst for health.

On, Pitmen, on! your cause it is good
This time, the world admits,
For water pure with your daily food,
And ventilated pits.

C. H. C.

INSTITUTE OF SURVEYORS, MELBOURNE.

AN association named the Victorian Institute of Surveyors has been formed in Melbourne, having for its objects the improvement of the status of the profession in this colony by the admission or retention of none but competent and trustworthy members; to afford some guarantee to the Government and the public requiring the services of surveyors; to provide means for the discussion of professional questions, with a view to mutual improvement; and to promote friendly relations amongst its members. The Institute has succeeded in attaching to it Mr. Skene, Surveyor-General; Mr. Ellery, Government astronomer and director of the geodetic survey; Mr. Couchman, chief mining surveyor; several of the district surveyors; and a large number of authorised surveyors in the Government service and in private practice. A preliminary meeting has been held, about forty gentlemen being present, who elected a council, consisting of Messrs. Ellery (president), Couchman (vice-president), Stuart Murray (treasurer), and Davidson, W. G. Couchman, Archdall, Gardner, M'Nulty, and Muntz; Mr. Skene, to whom the president's chair was offered, being unable, through pressure of official duties, to accept the position. The council has drafted general rules for the government of the Institute, and revised the list of proposed members, fifty-three, of whom thirty-eight are approved, eleven postponed for further inquiries, and four rejected. Leading members of the profession are taking a warm interest in the success of the Institute, and it is expected that its influence will have a beneficial effect upon the profession.

THE SLAUGHTER-HOUSES ACT.

THE Slaughter-houses Act, ordered by the House of Commons to be printed on the 15th of June, passed the second reading on the 3rd of July, and through Committee of the House on the 7th of that month, although copies of it were not procurable until one day before it reached the last-mentioned stage. As an amendment of the law-governing businesses declared by section 3 to be offensive, it might have been presumed that any advantage in priority of information would most properly have been given to the public who suffer from their noxious character, represented by the medical officers of health of the metropolis; but, instead, the Government exhibited marked concern for the prescribed trades (under the Building Act of 1844), by conferring with their principal members as to the manner in which they preferred to be dealt with, the public being the while kept in ignorance of the proposals intended for submission to Parliamentary decision. The necessary outcome of so extraordinary a legislative manœuvre is stamped upon the measure as it passed. Thanks for the vigilance of Dr. Dudfield, the Kensington Health Officer, and to the Society of Medical Officers of Health, whom he aroused to instant activity so soon as he could get a copy of the proposed statute, the measure of mischief it perpetrates is somewhat restricted. The "offensive" businesses were intended by the parties interested in them to be removed from all direct interference on the part of the vestries, whose medical officers and sanitary inspectors previously possessed certain powers of inspection and control—the latter secured by objection before the Justices in Petty Session. The 3rd section, as originally framed, while giving a monopoly to existing businesses which must be of enormous value to some of them—as instance, the tallow-melters,—also left them at liberty so to extend the area of their premises as to make their future suppression by perchance an almost inaccessible luxury, not to be contemplated by any save extremely wealthy parishes. The suggested amendments framed by Dr. Dudfield, and adopted by the Society of Health officers, drew attention to these especially obnoxious features of the Bill; and notwithstanding the indelicate haste with which, intolerant of sanitarian objections, the measure was pressed through both Houses, the resolute efforts of Dr. Dudfield, the Vestry of Kensington, and Mr. William Banting were successful in checking such gratuitous attacks upon the public weal.

Some doubt remains as to the precise effect of the 3rd and 10th sections (taken together) in altering the procedure in regard to slaughter-houses. By section 3 the sanction of the local authority is made a necessary preliminary to the renewal of any licence. By section 12, the "local authority" is defined to mean the Metropolitan Board of Works,—a body destitute of even the shadow of a sanitary staff,—for the metropolis outside the City; and the Commissioners of Sewers,—who have both medical and sanitary officers,—within the City. Section 3 requires notice of any application for a renewal of licence to be given by the Metropolitan Board of Works to Vestries, but invests the lay Board with the power of determining what measure of validity shall attach to the technical objections urged (on report of their sanitary officers) by the Vestries. Section 10 declares the duty of justices to be the renewal of licences "as a matter of course," and then goes on, assuming section 93 of the Metropolis Management Amendment Act, 1862 to continue in force,—to say that "such

[Metropolitan Board] may, if they think fit, show cause against such licence being renewed, in like manner as *such other parties* [the Vestries] *are empowered by that section to show cause.*" Here, plainly, is a muddle which may lead to interminable litigation, if indeed it do not, in effect, nullify the designed transfer of authority to the Metropolitan Board of Works. The 93rd section of the Act of 1862 is not repealed. On the other hand, in section 14 of the new statute it is provided "that the repeal" *only* of the sections of the Building Act, 1844, "enacted in this Act shall not affect . . . (3) the institution of any investigation on legal proceeding, or any other remedy for ascertaining . . . any liability . . . . . as aforesaid," apparently saving the Vestries' rights and powers of inspection; while section 17 further states that "Nothing in this Act contained shall affect the general law of nuisance, or make legal any act or default which would have been illegal if this Act had not passed, or, save as in this Act expressly provided, affect any Act of Parliament relating to any business specified in this Act." Assuredly, the Government is not to be congratulated upon the first step it has taken to redeem Mr. Disraeli's promise of legislation for the public health; and the Act itself furnishes a forcible illustration of O'Connell's famous *mot* anent the driving of a coach-and-six through the statutes of the realm. J. T. D.

THE STATUE OF QUEEN ANNE.

SIR,—Although the artistic qualities of the monument in front of St. Paul's are not great, I perfectly agree with the sentiments expressed in the *Builder* of last week,—with respect to the proposed removal. Similar sites have been chosen for monumental sculpture, from time immemorial, because sculpture so placed gives value by its smaller dimensions to the grand proportions of an important public edifice. The general outline of the monument is good, and the *coup d'œil*, as the cathedral is approached from the west, would suffer by the removal of the statue of Queen Anne. That Wren sanctioned its placement is sufficient reason why it should remain undisturbed, at least, until we can substitute something better of the same kind.

The lamp-post at the corner of Ludgate-hill is in the way, or anyone of those "forty thieves," as I heard those ugly turbaned porphyry posts called—if a man will be foolish enough to place himself behind it, not otherwise.

If we begin to quarrel with the art in our public monuments where shall we stop? Shall we leave Wellington at Hyde-park-corner, or the grotesque statues and quaint glass in our Gothic cathedrals? Sufficient for the day is the evil thereof, and it will be well if a coming age does not come giggling on with the *cry* of "Blot out the decorations of St. Paul's."

W. CAVE THOMAS.

THE SIMPSON MEMORIAL.

OUR readers will remember, says the *Weekly Scotsman*, that as the result of a movement set on foot shortly after the death of Sir James Y. Simpson, a sum of nearly 6,000*l.* was subscribed, chiefly in Scotland, for the purpose of obtaining a suitable memorial of that distinguished surgeon. In accordance with what seemed to be the general feeling, it was resolved that a portion of the fund should be expended on a statue, to be placed in some public position in Edinburgh, and that the balance, expected to amount to at least 3,000*l.*, should be made over to the Maternity Hospital, on condition that it should be supplemented by an equal sum, and applied towards the erection of a new building for that useful charity, with which the name of Simpson should in future be associated. With regard to the latter portion of the scheme, the proposed conditions were accepted by the directors, of the hospital. As to the statue, the acting committee lost no time in giving the necessary commission to Mr. W. Brodie, R.S.A., and the work, so far as the sculptor is concerned, is now nearly completed. The difficulties encountered in dealing with a figure such as Simpson's have been overcome by adopting the sitting posture. Being intended to occupy a site in some important street or square, the statue is designed on a colossal scale, about twice the size of life. The Professor is represented in his academic robes, as if in the act of lecturing to his students. Seated on a chair of classic design, which is for the most part hidden by the flowing drapery, the figure is posed in an attitude significant of the alert energy which was eminently characteristic of the man. Mr. Brodie hopes about two months hence to place his model in the hands of Messrs. Mansfield & Co., London, by whom it is to be cast in bronze. The sculptor is also engaged upon a bust of Simpson, which, with an accompanying bas-relief, illustrative of some feature of the great surgeon's career, is intended to be placed in Westminster Abbey.

BAD WATER.

WE may remind our readers that in the new Sanitary Act, which is now in force, there is an important provision as to private wells, tanks, and cisterns. On a representation to a nuisance authority that the water is polluted, the justices can order the parties to be summoned, and direct a portion of the water to be analysed. In cases of cisterns in private houses, the provision, if carried out, will be productive of considerable benefit, as on a representation that the water is so polluted as to be injurious to health, a summons can be issued. An appeal is to be allowed, and magistrates can grant costs when a summons is dismissed.

RIPLEY WATERWORKS.

FOR several years past the inhabitants of the small but flourishing town of Ripley, Derby, have suffered from an inadequate supply of water. The Local Board have for some time had the matter under their careful consideration, and several methods of remedying the evil have been suggested. At length it has been definitely decided to sink a well for the purpose, and pump the water sufficiently high to supply the town by gravitation. A field has therefore been purchased near to the town, and in a position where it is confidently believed that an abundant supply of pure water will be obtained at a depth of about 40 yards.

On Thursday, the 10th inst., active operations were commenced. The members of the Local Board met, and proceeded to the place, in order to turn the first turf, which inaugural ceremony, in the absence of the chairman, Mr. G. Staley, was duly performed by Mr. J. W. Nuttall, who afterwards, in a few appropriate words, expressed his satisfaction at the prospect of this long-felt want being soon supplied. The ground was afterwards speedily taken possession of by the contractor, Mr. W. Seddon, of Morley Park, near Belper; and the work of sinking the well is satisfactorily proceeding, under the superintendence of Mr. R. Argile, jun., sanitary engineer, of Ripley.

A NEW SYNAGOGUE IN PARIS.

THE inauguration of a new Jewish Consistorial Temple in the Rue de la Victoire has taken place. The nave, according to *Galignani*, is twice as wide as that of Notre Dame, and nearly as high. In the middle of the edifice is the Théba, the altar at which the rabbi officiates, and at the end the choir, with marble columns and stained glass windows, on which are represented allegories of the twelve tribes. At a higher level is a gallery, reserved exclusively for the female portion of the congregation. The building has cost two millions of francs, and taken ten years to construct. Barons Alphonse and Nathaniel de Rothschild, accompanied by the several members of their family, were present; and M. Beer, officiating minister, ascended the Théba, where was seen the seven-branched candlestick, a work of art more than 6 ft. in height, the tables of the law, an enormous crown symbolising the crowning of the latter, and two candelabra, the whole in massive silver. These ornaments were given by Baron Alphonse.

ACCIDENTS.

Scaffold Accident near Oldham.—At the village of Lees, near Oldham, seven men were engaged repairing the schools connected with Zion Chapel, and for that purpose were standing on a cross-beam. Without a moment's warning the scaffold gave way, and all the workmen were precipitated to the ground, a distance of nearly 30 ft. Two of them sustained broken limbs, two were were severely cut and bruised; the injuries of the other three were only slight.

Peril in Sinking Shafts at Bilston.—Two sinkers who were engaged in sinking a coal-shaft at Moxley, near Bilston, had a narrow escape. The sinking had reached a depth of about 150 yards. The men had fired a shot, and were being drawn to the surface to await the explosion. When within thirty yards of the pit's mouth the crank of the engine broke. With great presence of mind the engine-tender applied the break instantly, and so prevented the men being dashed to the bottom. They remained suspended where they were for about an hour before they could be released.

HOARWITHY NEW BRIDGE COMPETITION.

SIR,—In response to the advertisement for designs for this bridge, I sent in a drawing for an iron structure based upon the meagre information the solicitors vouchsafed in a written communication.

The directors were to meet on the 30th of April to decide upon the designs, but from that day to this I have been unable to obtain any reply or information whatever, although I have written to the solicitor three or four times, and also to the directors, nor has my drawing been returned.

I do not care a pin about the competition, but the uncourteous behaviour of the parties who have received the designs is hardly bearable. What am I to do to recover my drawing? It may not be worth sixpence, but I have a right to it, or to be paid the premium, surely.

Perhaps some of your readers may be able to say if an action at law could be sustained, based upon the premium as the maximum damages; if so, I am prepared to try the point, and thus settle a much-vexed question.

NOT THE "MAN OF ROSS."

BILLS OF SALE ON TRADE MACHINERY.

THE Act to Amend the Law relating to Mortgages of Machinery and Bills of Sale sets forth:—With regard to mortgages of machinery, that trade machinery shall be deemed to be personal chattels, within the meaning of the Bills of Sale Act, 1854; and it confirms past mortgages of trade machinery and permits of their registration.

With regard to the law as to bills of sale, the Act reserves certain priorities of bills of sale, and provides that a bill of sale shall be executed in the presence of an attorney on behalf of the person.

Trade machinery is thus defined for the purposes of the Act, unless there is something in the context inconsistent with such meanings; that is to say, "trade machinery" means the machinery used in, or attached to, any factory or workshop. 1st, exclusive of the motive powers, such as the water-wheels and steam-engines, and the steam-boilers, donkey-engines, and other fixed appurtenances of the said motive powers; and 2nd, exclusive of the power machinery, such as the shafts, wheels, drums, and their fixed appurtenances which transmit the action of the motive powers to the other machinery fixed and loose; and 3rd, exclusive of the pipes for steam, gas, and water in the factory or workshop.

Builders and other firms borrowing funds on the security of machinery will find the Lord Chancellor's Act somewhat complicated, and a solicitor must now be called in to draw up all bills of sale, thus adding to the expense entailed by borrowers.

SCHOOL BOARD SCHOOLS.

Kingsland.—The formal opening of the Tottenham-road school took place under the auspices of Sir Charles Reed; and, notwithstanding the disagreeable weather, a very large number of the inhabitants of the district attended, and evinced a lively interest in the educational movement. The school, which is capable of accommodating 726 boys, girls, and infants, was built by Mr. Robson, the School Board architect, at a cost for site of 3,032*l.*; building, 9,268*l.*, being at the rate per head for site, 4*l.* 6*s.* 5*d.*; for building, 8*l.* 8*s.* 10*d.* The schoolrooms are spacious and airy, and the whole establishment is fully supplied with educational appliances. The Tottenham-road School completes a total of sixty-five schools already established by the Board, and capable of accommodating 57,042 children. The gross cost for sites has been 146,939*l.*, and for buildings, 404,707*l.*, giving an average cost per head for site and building of 9*l.* 13*s.* 6*d.* Sir C. Reed was supported by Mr. Currie, vice-chairman of the Board. The Chairman, in opening the proceedings, remarked upon the gratifying fact that the School Board had now sixty-five schools open out of 100 originally contemplated. Four years before it had been decided that school accommodation should be provided for 100,000 children, and they had already provided for 57,042. In addition to this they had many temporary schools all crowded with children waiting impatiently for the opening of their permanent schools. In Hackney district there were, in 1873, 123 efficient schools, accommodating 28,185 children, and this year the average attendance was 25,228. He was obliged to add that there were still 16,245 children not going to any school, and of these upwards of 7,000 were between five and seven years of age, and would therefore soon be released from responsibility. There were 9,744 attending non-efficient schools, and these schools,

he must remark, had been condemned, not by the Board, but by the Education Department. Having given a few more figures, the Chairman concluded by stating the gratifying fact that a school was about to be opened for the blind, deaf, and dumb in Bethnal-green. He trusted that something would also be done for the poor cripples, of whom there were 277 in Hackney alone. Mr. Currie followed with a detailed statement of the cost of the school, and a few observations respecting the deplorable educational deficiencies of children whom the Board had taken from other schools.

Lambeth.—A new School Board school in the Lambeth division, and situated in James-street, Southampton-street, Camberwell, has been opened by Sir Charles Reed, in the presence of a large number of the inhabitants. In touching upon the action of the Board, he said that in that district, if all the available schools were filled, there was a deficiency for 1,922 children; this school would accommodate 590, and the one building in Gloucester-road would accommodate 1,000, a statement which he thought would furnish an answer to any cry that they were going too near existing schools. The site has an area of 11,326 ft., and with legal charges cost 2,169*l.* 12s. 10d.; the cost of the building is 5,017*l.*, so that the total is 7,186*l.* 12s. 10d., or about 11*l.* per head of the children. The details of the accommodating powers are,—214 boys, 161 girls, 215 infants.

Gateshead.—The schools in Prior-street, Gateshead, erected by the Gateshead School Board, were formally opened on the 7th inst. A public meeting being held for the purpose. The Mayor (Mr. George Charleton) presided. Among the speakers were Sir Walter James, bart., Mr. James, M.P., and the Ven. Archdeacon Prest. The new buildings are situate on a level site of nearly two acres in extent, at the junction of Eldon-street and Prior-street, and are in two distinct and separate blocks, that for the infants' department being in one story, and that for the boys and girls in two stories. The boys' school consists of one large main school-room, 56 ft. by 34 ft., with seats arranged on the "double Battersea" plan, and three class-rooms, each 20 ft. by 18 ft. The girls' school, which is on the first floor, approached by a stone staircase in short flights, is almost identical in its arrangement with the boys' school, over which it is placed. The main school is somewhat larger than the boys', being 63 ft. 6 in. in length, and the class-rooms being the same size as those for the boys. The infants are accommodated in two large main school-rooms, each 56 ft. by 34 ft., with four class-rooms, each 20 ft. by 16 ft. 6 in. Internally, the whole of the walls are plastered and finished a pale grey colour, with a dark dado painted round for a distance of 4 ft. from the floors. Externally, the buildings are finished with picked common bricks, with red bands and stone dressings; the roofs are slated, and have red clay ridge tiles. The girls' staircase has been carried up in the form of a low bell-tower, with a high-pitched roof. The chimneys are throughout made bold and massive, and are carried to a considerable height to ensure a good draught. The school buildings are surrounded by strong wrought-iron palisading, on dwarf walling, with piers. The playgrounds are enclosed with sold walls, about 8 ft. high. Accommodation is provided for 373 boys, 405 girls, and 636 infants, giving a total of 1,414 children. The boys' and girls' schools are planned to give an area of 8 square feet of floor space, and 128 cubic feet of air to each child, the infants' schools to give 8 square feet and 136 cubic feet to each child. The cost of the buildings, including fittings, boundary-walls, &c., has amounted to 7,533*l.*, or 5*l.* 6s. 4d. per child. Mr. John Harrison, of Gateshead, was the sole contractor; Messrs. Walker & Emley supplied the stoves and heating apparatus; Mr. Edington has acted as clerk of the works; and Mr. Thomas Oliver, of Newcastle, was the architect.

The Margate Aquarium.—We note that the preliminary preparations in connexion with the works of this undertaking, under the cliffs near Fort Point, have been commenced during the past week, under the superintendence of Mr. H. Law, C.E., engineer to the company. The wall will be constructed entirely of concrete blocks of six tons' weight, which have been made upwards of four years. These blocks, a number of the same kind of which were set at Dover dry, will be set in cement here.

CHURCH-BUILDING NEWS.

Howdon.—The foundation stone of St. Paul's Church, Howdon, has been laid. The church will be in the Gothic style, and will seat 320 persons. A chancel is in contemplation, and when that addition is made, the number will be 440. The estimated cost of the church is 2,600*l.*, and the chancel will cost 1,000*l.* more.

Campsall.—For years it has been seen that something must be done for Campsall church, else it would altogether go to decay; and at length it was decided to restore the church, and Sir G. Gilbert Scott was invited to inspect and report upon the work and cost. The then condition of the church was reported on by Sir G. Gilbert Scott, and an effort was at once made to raise the sum required. A subscription list was opened, and a sum total promised or paid (to the present time) of 2,000*l.* The contract for the restoration was given to Messrs. Shillito & Morgan, of Campsall, and the first work undertaken was the nave. The greater part of this is now nearly complete. The walls have been stripped of their whitewash, and these and also the pillars and arches have been fresh pointed and repaired. A new roof and pavement of Staffordshire tiles have been fixed, and a new stone font added. While these repairs were being carried out, the Sunday and other services were conducted in the chancel and other parts of the church, but now these have been finished, service is held in the newly-restored nave. The other portions of the church are now being attended to, but it will be some time yet ere all is completed. The estimated cost of the entire restoration was 4,000*l.* Other work, however, which it has since been found necessary to do will swell the expense to nearly 1,000*l.* more. Against this, however, the patron of the living, Mr. G. B. C. Yarborough, of Campsmount, and several members of his family, have undertaken the restoration of the chancel, the cost of which is estimated at about 1,100*l.* The total sum, therefore, required is about 4,000*l.*

Kingston.—The memorial stone has been laid of a church, which, with a vicarage, is to be built at the foot of Surbiton-hill, on the border of Kingston parish, at a cost of some 19,000*l.* The whole expense will be borne by Mr. Coulthurst, who is erecting the church and vicarage "as a thank-offering to God for blessings vouchsafed; for the faithful preaching of his word; and in memory of his beloved and only sister, Hannah Mabella Coulthurst." Lord Lovelace laid the stone.

Northampton.—A meeting of the St. Giles's restoration committee has been held, at which Mr. Law, the architect, presented his report on the state of the church, and a meeting of the parishioners and friends is to be called, at which the minutes of this meeting will be read, advising the repairs of the substantial portions of the church and side chapels, including roofs and floors, in pursuance of Mr. E. F. Law's plan and estimate, and during the interim the plans lie at Mr. E. F. Law's office for inspection.

York.—The Archbishop of York has consecrated the Church of St. Clement, York, a church which is to form a chapel of ease for a district of the parish of St. Mary's, Bishophill Senior, outside the walls, known as Clementhorpe. The church is built inside and out of red stock brickwork, relieved with bands of black bricks, stonework being only used when constructively necessary. The plan of the church consists of nave and aisles and an apsidal chancel, with organ-chamber on the north and vestry on the south side. The nave is divided from the aisles by arcades of four arches each. These arches are of moulded brickwork, and are carried by circular stone pillars, having carved caps of conventional foliage. Above the nave arcades are the clearstory windows, of simple pointed character. The chancel has one three-light window in eastern bay of apse, and a two-light window to side bays. The west window of nave is of four lights, and side aisle windows of two lights. All the windows are glazed with cathedral glass, and the east window will shortly be filled with stained glass by Capronière, of Brussels, the gift of Mr. G. Wilson, in memory of his wife. The entrance doorways are at west end of north and south aisles, and have inner wooden porches with folding doors. A small bell turret is corbelled out from buttresses at the west end, and contains one bell. The roof to nave and aisles is open-timbered, dressed, stained, and varnished, and the places between the spars are plastered. The roofs are covered with Lancashire blue slates. The open seats, and joiners' work generally, are of pitch pine, stained and varnished. The church ground is enclosed by wrought-iron railings. The total cost of the building, which will accommodate 557 people, will be about 3,800*l.*, and the work has been carried out from the designs, and under the superintendence of Messrs. J. B. & W. Atkinson, architects, York. The following contractors have carried out the works—brickwork and masonry, Biscombe; carpenter and joiners' work, Rookledge; slating, Wood & Co.; plumbing and glazing, Robinson; painting and staining, Pearson; carving, Cole; ironwork, Bousfield.——The new church which has just been erected for the use of the patients of the North Riding Lunatic Asylum has been formally opened for special service and sermon by the Hon. and very Rev. the Dean of York. For many years past a large room has been fitted up and set apart for divine service, but recently that room, which was in the centre of the main building, has been found too small for the large number of patients. Apart from the circumscribed space, an almost insuperable objection to it as a place of worship arose, on the part of some of the inmates, on the ground that it was not a "church" they were required to attend. The result was, that last year steps were taken to obviate the difficulty by the erection of a new church on the grounds of the institution. A site, immediately facing the principal entrance to the asylum, and nearer the River Ouse than the institution itself is, was selected, and here a church has been erected. The church is cruciform, and consists of nave, transepts, chancel, and tower, and is entered by a western porch. The lower portion of the tower is utilised as a room for epileptic patients. The north transept is divided from the church by an ornamental traceried screen, with carved caps and mahogany shafts. The organ, which has been restored and enlarged by Mr. Denman, is placed in the south transept, the screen of which matches the vestry screen. Underneath the vestry is placed the heating-chamber. There are four steps from the chancel to the Communion-table. The aisles are laid with red, black, and buff tiles, in patterns, and the chancel is laid with encaustic tiles. The east end is octagonal, lighted by three two-light windows. The roofs are open-timbered. The nave and transept roofs are plastered between the spars; the chancel roof is boarded. The whole of the sittings, doors, pulpit, screens, &c., are made of pitch pine, and are varnished. The exterior is faced with Bradford wall stones and Whitby stone dressings. The design is of an Early Decorated character throughout. The nave and chancel are lighted by two-light tracery windows, the sides of the transept and tower are lighted by one-light tracery windows, and the west gable has a three-light window. The tower is surmounted by an octagonal belfry. There is but one bell, and above the belfry rises a dressed Whitby stone spire, terminated by a gilt vane and lightning conductor. The height is 92 ft. from the ground. The architects from whose designs the church was erected, were Messrs. Gould & Fisher, of York. The stone carving has been executed by Mr. Hessay, of York. The contractors for the remainder of the work were:—Mr. Biscomb, builder; Messrs. Bellerby, joiners; Messrs. Hodgson, plumbers (who also supplied the heating apparatus); Messrs. Dodgson, slaters; and Mr. Hick, painter.

Hammerwich, near Lichfield.—The new church of St. John the Baptist, Hammerwich, has been opened for divine service. The new edifice is built in the Early English style, the plan being a double parallelogram, forming a nave and chancel with a north aisle, which is separated from the nave by three arches, supported on moulded and carved columns. At the end of the north aisle is a small organ-chamber and vestry. The tower forms the west entrance to the church. The nave is lighted on the south side by couplet lancet windows, between each of which a buttress of two stages is introduced, thus dividing the nave into three bays. The windows of the north aisle are very much smaller, but have three lights to each bay. The doorway of the tower, which is the west entrance to the church, has stone columns, with trefoil-head, moulded, and recessed-arch moulding, carved capitals to the columns, with the dog-tooth ornament introduced into the jamb and arch-moulding. The tower is of three stages, with large couplet lancet-windows placed on each face of the belfry-stage, with a spire of stone, and being little short of 100 ft. in height. The roofs are open-timbered. The chancel, which is the most important feature of the interior, is large for a church of such dimen-

sions. It is constructed entirely of stone from the quarry in the hamlet, whence was taken the stone for two other neighbouring churches. It is also said to be the same quarry from which a large quantity of the stone used in building Lichfield Cathedral was taken. The chancel has a groined roof. The window immediately over the altar is almost identical with the eastern window in the old church, there being a desire on the part of the parishioners to preserve this. The woodwork is of deal, stained; the floor tiled, that of the chancel in colours, of an enriched pattern of Minton & Co.'s manufacture. The architects were Messrs. Newman & Billing, of London, from whose designs the work has been carried out by the Rector, the Rev. R. Gordon, and Mr. James, of Gentleshaw, who has acted as clerk of the works. The church will seat about 250 persons, and has been erected at a cost of little under 3,000*l.*

Newtown (Welshpool). — St. David's Church, Newtown, after being closed for some months for alterations and re-arrangement of seats and other improvements, has been reopened for divine service. The contract for the works was taken by Mr. Edward Williams, of Newtown, builder. The architect, from whose designs and under whose superintendence the work has been carried out, is Mr. David Walker, of Liverpool. It may be added that after the removal and refixing the organ, the main front pipes were painted and gilded by Mr. R. Powell, of Severn-square, from the architect's designs. The alterations cost about 2,250*l.*, and an estimate for the east window, by Messrs. Clayton & Bell, of London, is 570*l.*

Maidstone.—The foundation-stone of St. Peter's Church has been laid. The site selected is at the upper portion of St. Mary's-hill estate, and faces the road leading to Hall's Hole. The church is to be from plans of Mr. Cronk, architect, of Tunbridge Wells, and will be a thank-offering for the recovery of the Rev. Canon Hoare. It will be built of local stone, with windows of Bath-stone dressings and tiled roof, and will consist of a nave and chancel. Accommodation will be provided for 450 persons, and the church is so arranged that aisles can be added.

DISSENTING CHURCH-BUILDING NEWS.

Newcastle-on-Tyne.—The Bainbridge Memorial Chapel, to seat about 300, and designed by Mr. Thomas Oliver, architect, Newcastle-on-Tyne, is now in course of erection by the Wesleyan body of that town. The four corner-stones were laid as separate foundation-stones a short time ago. The cost of the building will be about 3,000*l.*

West Bromwich.—It has been resolved to erect a Unitarian Church here. About 1,000*l.* were subscribed in the locality and in Birmingham, and a site having been obtained adjoining the district hospital, the erection of a chapel was proceeded with. The builders are Messrs. Stockton & Sons, of Oldbury; and the designs have been prepared by Mr. Pipson, of Birmingham. The chapel is intended to accommodate 300 or 400 persons. The estimated cost of the building is about 1,400*l.*

Nottingham.—A new Wesleyan chapel, which has been erected in Tennyson-street, has been opened for divine worship. The building is designed to provide accommodation for the Dissenting inhabitants of the Forest district. The style of architecture is modern Italian; the outer walls of the sub-story are built of rock-faced Bulwell stone, and the remainder of pressed bricks, with Hollington stone dressings. The front is divided into centre and side wings; the central portion contains three entrances, which are approached by a flight of terrace steps. The doorways have polished marble columns with enriched caps; the arches and other dressings being of Hollington stone. The sub-story contains a schoolroom, 58 ft. 4 in. by 35 ft.; band-room, 25 ft. by 20 ft.; four vestries, each 14 ft. by 13 ft.; and spacious rooms for heating apparatus, &c. The whole of these rooms are 13 ft. high, and approached by two wide flights of steps outside and two inside. A wide area is left all round, affording ample space for light and ventilation. The internal dimensions of the chapel are 100 ft. by 59 ft. The ground-floor is approached by a wide vestibule and inside corridor extending the whole width of the chapel, the staircases to the gallery being at each end of same. The ground-floor will seat 800 persons, and the gallery about 200 persons. The pews are arranged in the amphitheatre form, divided by four aisles, giving good space for ingress and egress. The ceiling is constructed with ornamental coved cornice, and divided into moulded and enriched panels, the ribs of panels extending down the cove, stopping on ornamental corbels. The windows have enriched archivolts and strings. The outside of the chapel is enclosed by a rock-faced Bulwell stone wall and palisade. The total cost will be 6,000*l.* The principal contractor is Mr. Henry Vickers, and the sub-contractors are:—stone work, Mr. McPherson; plastering, Mr. Wilkinson; plumbing and glazing, Messrs. Corden Brothers; heating apparatus, Messrs. Lewis & Grundy; gasfitting, Messrs. D. New & Co.; and ironwork, Messrs. Goddard & Massey. The pulpit has been built by Messrs. Stevenson & Weston. The architect is Mr. Collyer.——The foundation stones of a new Primitive Methodist chapel and schools have been laid at the Forest-road. The building is being erected by Mr. Priestley, and the architect is Mr. R. C. Sutton. The contemplated cost will be about 2,000*l.* The place is 60 ft. by 40 ft. inside, and the basement story consists of a large schoolroom, five class-rooms, scullery, and heating apparatus. The chapel is to accommodate, seated, about 400 persons, and its height is 26 ft. from the floor to the wall-plate. It will be built high enough for a gallery, but, for the present, it is not intended to put one in. On the northern side of the chapel is the preacher's vestry, which will be fitted up with requisites for such an apartment. On the eastern side there is space for a minister's room, which might be erected on some future occasion. The general style is modern Italian.

Leeds.—The foundation-stone of a new Wesleyan chapel has been laid in Leeds, the site of the proposed building being at the corner of Hyde Park and Clapham roads, Woodhouse Moor. The edifice, which is part of an extension scheme in connexion with Oxford-place Circuit, is to cost 8,000*l.*, and will accommodate 1,000 persons.——Another stage in the completion of the extension scheme at present being carried out by the Wesleyans of Leeds has been arrived at. The new chapel, which has been erected in Woodhouse Carr, to supersede the old schoolroom used as a preaching-room in that now rapidly-growing suburb, has been formally opened for public worship. The chapel, which has been erected from the designs of Mr. G. F. Danby, Leeds, will comfortably seat 500 persons, and by the erection of side galleries the accommodation can be increased to 650. The style of architecture is Italian, and the building is of stone, lined with brickwork. The front is to Meanwood-road, from which a wide flight of steps leads into a lobby, and thence into the body of the chapel, and by staircases to an end gallery. A minister's vestry, with organ-chamber over, is placed at the rear, and is approached by a separate entrance and staircase. Under the chapel, but raised above the ground level, is the schoolroom, to hold 300 scholars, with separate entrances for boys and girls; also class-rooms, library, kitchen, and all other necessary accommodation. Both chapel and schoolroom are heated with hot air. The whole of the internal joiner-work is stained and varnished. The building is surrounded with a low wall, surmounted by iron railings. The total cost, including land, has been 3,250*l.* The works have been carried out under the superintendence of the architect by Mr. Charles Myers, mason; Mr. J. Ledgard, joiner; Mr. J. Franks, plasterer; Mr. Williams, plumber; Mr. J. Blackburn, painter; and Mr. Rawlins, slater.

ROMAN CATHOLIC CHURCH BUILDING NEWS.

Bedford.—A new chapel has been opened at Bedford. The building is situated on the Midland-road. The style is late Early English, and the structure is built of stone from Warrington, near Olney, with Bath-stone dressings. It has a nave with two aisles, the dimensions of the body of the building being 41 ft. by 40 ft. It is intended to carry out the structure, when needed, another 26 ft. The chancel is 24 ft. by 22 ft. 4 in.; opening from it there are two side chapels, each 11 ft. 8 in. by 8 ft., the one dedicated to "the Blessed Sacrament," and the other to the Virgin Mary. One of the chief features is the groined wooden roof of the chancel, which is adorned with bosses decorated with various symbols, viz., the Holy Child on the cross, the Agnus Dei, the pelican, and the I.H.S. The reredos is in harmony with the architecture of the chapel. In four compartments, under carved canopies, are figures of four saints,—St. David (with the harp), St. Gregory, St. Nicholas, and St. Andrew. The decorations, including the reredos, which is by Farmer & Brindley, and the ornaments of the altar, are the gifts of children in Great Britain and Ireland, and also children of France and Belgium, in honour of the Holy Child. The altar and tabernacle are of marble. The total cost of the portion erected, with fittings, &c., is nearly 4,000*l.* It has been built by subscription, many of the chief donors being anonymous. The architect of the building is Mr. Gilbert R. Blount. The builder is Mr. John Watkin, of Northampton.

Canterbury.—Recently the Duke of Norfolk laid the foundation stone of a new Catholic church at Canterbury. The site of the new church is at the back of the dismantled Protestant church of St. Mary Magdalene in Burgate-street. The new edifice has been designed by Mr. John Green Hall, architect, Canterbury, and will be in the Early Decorated style of architecture. It will comprise nave with aisles, sanctuary, three side chapels, two confessionals, priests' and boys' sacristies, reliquary room, organ chamber, and baptistery. The plan of the building forms a parallelogram, from the east end of which projects the sanctuary, where the high altar will be placed, and at either side on the level of the floor of the nave will be a side chapel, dedicated to the Virgin Mary and St. Joseph respectively. The remaining chapel and the sacristies are on the left of the nave, and one of the confessionals is placed on the right and another on the left, and they will be built in between two of the external buttresses, thus avoiding their projecting into the body of the church. The roof of the nave rises to a height of 50 ft. to the ridge, and will be open timbered, with boarded roof stained and varnished. The front elevation will have a spire rising above the central gable, flanked on either side with a pinnacle. The spire will be 76 ft. high. The front elevation will be faced with Kentish-rag stone and Bath stone dressings, the remainder of the church will be built with white bricks and Bath stone dressings. The estimated cost of the edifice, which is designed to accommodate 450 persons, is 4,000*l.*, without pulpit or any internal fittings. Messrs. Gaskin & Godden, of Canterbury, are the builders, and the work is to be completed in about twelve months.

SCHOOL BUILDING NEWS.

Slough.—The new British School in Herschel-street, the foundation-stone of which was laid in August last, by Mr. Lambert, M.P., having been completed, the event has been celebrated by a dinner in the schoolroom. The building has been erected at a cost of 561*l.*, 150*l.* for ground, and 150*l.* it is estimated will be expended in school fittings, and other expenses. The school has been erected at a cost per pupil of only about 3*l.*

Longborough.—The foundation stone of new schools has been laid at Longborough, a picturesque village, which stands on a slope of the Cotswold hills, between Stow and Moreton. The new schools are contiguous to the road, and within easy access of the vicarage and the old parish church. The school is to be erected for the extra school-room accommodation prescribed by the new Educational Act. The site was originally the playground of the old school. Lady Rushout laid the stone. The school district, which includes Sezincote, has a population of nearly 700, and the rooms are for the accommodation of 150 children. The builders are Messrs. Newman & Sons, of Evenlode, and the cost of the new schools will be about 500*l.*

Uploman (Devon).—New Church of England and voluntary schools have been opened at Uploman. The inhabitants decided to avoid employing the machinery of a school board, and although the parish is essentially an agricultural one, and not largely populated,—the parishioners at the last census numbering, we believe, about 440,—sufficient money has been raised by subscriptions, aided by the Government grant, to provide for the erection of the building, which has accommodation for about 100 children. The cost is 600*l.* There is a playground attached to the school, which is situated in a healthy position. The building was erected by Mr.

Churchward, of Exeter; Mr. Wood, of Lurley, Tiverton, being the architect.

Saltney.—The "Wood Memorial" British schools at Saltney have been opened. The late Henry Wood was a large employer of labour in the place, and it was his intention to erect the schools which have just been completed, but he died before he could give effect to his wishes. His family, however, caused the schools to be erected. To the managers of the Chester British Schools Association was entrusted the management of the schools.

Sutton.—The new chapel and school-rooms for the junior department of the South Metropolitan district schools at Sutton, have been opened by Lord Fortescue, in the absence of the Earl of Shaftesbury, who was to have presided on the occasion. This school district was formed in 1849, and was a combination of seventeen parishes, situated in the eastern and south-eastern portions of the metropolis. It was constituted under an Act of Parliament, designed to effect an entire separation of children from adult paupers, to train them in various departments of industry, and to fit them for domestic service and apprenticeship. The ground and building have cost upwards of 90,000*l.* The average number of children maintained in the school is 1,550; the cost of the maintenance and clothing being 4*s.* per week. The first admission of children was made in 1855. Since then 13,903 children have been received into the school. Upwards of two-thirds of this number were admitted in consequence of the temporary distress or affliction of their parents, and were taken out as soon as the circumstances of the parents enabled them to provide for them. Of the remainder, 1,182 had left for domestic service; 1,323 have been apprenticed to various trades; 180 have entered military bands; thirty-six have become schoolmasters and mistresses. The children are employed in the schools in nearly all the industrial trades, being kept part time at education and part time at work.

Miscellanea.

Prehistoric Remains in Oceania.—Only some few isolated facts are known concerning the population of the islands of Oceania before the discovery by European voyagers, and any addition to our knowledge, however small, is, therefore, of great value. According to the *Academy*, a Manilla paper announces the discovery of some prehistoric remains, apparently akin to those of Mexico and the United States, on the little islands of Rota and Tinian, which form part of the Ladrone or Mariana Islands. We have as yet but very scanty particulars of these antiquities; but they appear to consist in each case of two series of eight stone pyramids, standing in two rows, at intervals of 12 ft., the base being 12 ft. square, and the height 36 ft. The summit is crowned by a kind of large cup equal in diameter to the diagonal of the base. Unfortunately the description of these pyramids given us leaves much to be desired; but there is little doubt that they belong to an age anterior to the Spanish conquest, and that they cannot possibly be ascribed to a race at all similar to the vindictive and degraded aborigines of the archipelago. From the present description these monuments would seem to have much in common with the prehistoric remains found in Mexico and some of the United States.

Tewkesbury Abbey Church.—Most of our readers have heard by this time that this fine old abbey church, the nave of which dates from the early part of the twelfth century, will shortly undergo a partial renovation at the hands of Sir G. G. Scott. The galleries and lath-and-plaster partitions, together with a huge canopied corporation "pew," have been already removed; and the organ-gallery, which occupies the position of the old rood-loft, will shortly follow. The ancient carved oak stalls, which are in very good preservation, will be moved to their original position east of the transepts. The pews, some square and some oblong, which were introduced in the year 1796, will also be cleared away, and chairs or open benches substituted. The entire area of the church from east to west will thus be thrown open and made available for worship, and the seats will, as indeed is the case at present, be entirely free and unappropriated. A London committee, to assist in collecting the necessary funds, is in process of formation.

Siemen's Process in the Manufacture of Glass.—In the report just issued by the Inspectors of Factories, the following description occurs:—"The melting of glass has always been done in large 'pots,' of which four are usually arranged in each glass-house, in such a manner that all are heated together and all are worked together. These 'pots' are large circular vessels of fire-clay, rather more than 3 ft. high, with about 3 ft. internal diameter at the top, gradually sloping to about 2 ft. at the bottom, and about 3 in. thick. They are three months in being built, and have to be kept in stock for twelve months to season, and last when in use, on an average, four weeks. Sufficient metal is put into each 'pot' for one day's use, and the 'founding' or melting of the metal has to be so arranged every day as to provide for each man's day's work. This necessitates very early hours for the blowers of the glass, *e.g.*, their week usually begins on Monday morning at 2 or 3 a.m., on Tuesday the same, on Wednesday at 4, and Thursday at 5 a.m. By Siemen's process the metal is melted in a large tank, 14 ft. by 10 ft., by 1 ft. 6 in. deep, made of large fire-bricks called 'quarries.' This tank, when filled, will hold sufficient metal for several days' work, but in practice is not emptied, because it is replenished every day, and on this account, the metal being always ready, the men can have fixed hours for work and meals every day, just the same as any other factory, by this means entirely doing away with the necessity for young persons and men having to start work so early as 2 or 3 a.m., thus causing an entire change in the working habits of the trade, and greatly improving the moral and physical condition of the workers. The metal is melted by the combustion of gas and common air, on the principle of Bunsen's burner, by an arrangement effective and ingenious, in which there is a great saving of fuel, with complete combustion of smoke. The tank will last four months, but the top will last about two years. The regularity of the work hours, from 6 a.m. to 6 p.m. (with suitable meal hours), is such a boon to the workers that all are anxious to work in this department."

Life.—According to an American medical writer who has compiled some very suggestive statistics showing the relative rank of different countries according to their effective population. Out of 10,000 children born, it is found from official statistics that in Norway as many as 7,415, or, roughly speaking, three out of every four, live to be twenty years of age. In England only 6,627 so live, or 788 fewer than in Norway. In the United States boys have nearly as good a chance of life as in England, while girls have not. But in France only 5,022, or scarcely more than one out of two, reach twenty; while in Ireland no more than 4,855, or actually less than one out of two, attain that age. Out of the same 10,000, we learn that in Norway 3,487, more than one out of three, reach seventy; in England almost one out of four; in the United States, still men only, one out of four—a trifle higher than England; in France, 1,776, or about one out of eight and a half; and in Ireland only 861, or one out of eleven and a half. Thus Norway offers the new-born child the best chance of long life, while Ireland offers the worst.

Another Workmen's City.—We understand that the directors of the Artizans', Labourers', and General Dwellings Company have obtained a site of eighty acres, near the Harrow-road, on which the erection of a new "city," to accommodate no less than 16,000 persons, is about to be commenced. The plans have been drawn up and the roads marked out, and the city will be constructed on the same general principles as those carried out on the Shaftesbury Park Estate. It is stated that, although not a single brick has been laid, applications for upwards of 1,000 houses have been made. The capital of the company, which was at first 250,000*l.*, has been increased to 1,000,000*l.* The estate will be called the Queen's Park, and four out of the eighty acres will be appropriated in the centre to a garden and recreation-ground. It is to be hoped the site has been better chosen than that on which the Shaftesbury Park houses have been built.

The Electric Telegraph in China.—A remarkable concession on the part of the Chinese is just announced. The Great Northern Telegraph Company has received permission to construct a land line between Amoy and Foochoo. Hitherto the Chinese have resolutely refused to sanction land telegraph lines.

Glasgow Masons and the Apprentice Question.—A meeting of masons was held in the Trades' Hall, Glasgow (Mr. Curran presiding), to consider the apprentice question. The Chairman complained of the evil effects of the present loose system of the apprentice law. The following motion, proposed by Mr. Boa, was then adopted:—"That this meeting having reason to believe that great injury to the trade, annoyance to the employer and employed, and ill-feeling between both are caused through the present mutual non-recognition and application of the apprentice laws, hereby resolves that it be a bye-law, with the lodges assembled, subject to the ratification of the Association, that every apprentice be engaged or bound for a term of years, apportioned thus—four years to the hewing and one to the building, or *vice versâ*, and that he should not be considered eligible for admission into the Association until he has satisfied the lodge that those conditions have been observed; and further that it be binding on all members to refrain from taking work in any squad where non-bound or non-engaged apprentices are at work." A motion proposing a limitation of apprentices was negatived by a large majority.

The Seats put up by the Board of Works.—In an Act passed in the late session (chapter 97 local) it is recited that the Metropolitan Board of Works had incurred expenses for the accommodation of the local governing bodies of the metropolis on the occasion of the visit of her Majesty and the Prince and Princess of Wales to St. Paul's in 1872, and questions had been raised as to the power of the Board to defray such expenses. "And whereas such expenses were incurred by the Metropolitan Board of Works in the *bonâ-fide* belief that in so doing they were not exceeding their powers, and it is expedient, therefore, that provision be made as in this Act contained with reference to such outlay," it is now enacted that the Board may defray the expenses of structures and seats in Hyde Park and on Holborn Viaduct on the occasion of the State visit on the 27th of February, 1872.

Extensive Building Proposal near Hull. At a recent meeting of the Cottingham Local Board it was mentioned that Councillor D. P. Garbutt, of the Hull Town Council, intended laying out for building purposes an estate of 230 acres just outside the borough, and adjacent to the Park. The proposed drainage for Cottingham, near the estate, is to be enlarged, and six or seven boulevard streets constructed, drains filled in, trees planted, and work done at a cost of about 80,000*l.* The estate is to be called the Westbourne Park Estate, and in the boulevards are to be "circusses" with fountains. Mr. Garbutt has offered to take the present Hull Botanical Gardens at a valuation, and to sell from twenty to thirty acres on the new estate on reasonable terms.

St. George's, Easton-in-Gordano.—A memorial window to the late Mrs. Mirehouse has just been inserted in the north aisle east window of this church. The subjects are part of a scheme illustrating the principal events in our Lord's life; the call of the disciples and the miraculous draught of fishes being the ones that have been arranged for this window. The panels in which they are placed are formed in canopy work of a character suited to the architecture of the building. The larger tracery pieces have angels, on whose scroll is the text: "These men see the works of the Lord." The window has been executed by Messrs. Bell & Sons, of Bristol, who also painted the east window, given by Mr. de Winton, at the time of the church's restoration.

The Restoration of Rochester Cathedral. An appeal is made by the Dean and Chapter of Rochester, for assistance in the work of restoring the cathedral. The Dean and Chapter have expended more than 10,000*l.* on the restoration of the fabric, so far as regards the choir and north transept, and the fittings of the choir are being restored at a cost of 3,000*l.*, the munificent gift of the Rev. Dr. Griffith (late Canon) and Mrs. Griffith. It is stated that at least 17,000*l.* more will be required for the completion of the entire work.

Edinburgh Town Council.—The Council met on Tuesday last week, and, amongst other things, considered and remitted to the Lord Provost's Committee a modified plan submitted by Mr. Gowans for ornamenting the archway under the North Bridge abutting on Jeffrey-street.

The Latent Scheme for the Improvement of the Liffey.—It is stated that there are nearly fifty plans to be reported upon by those engineers at present sitting in commission at the City Hall, Dublin. As plans were invited generally, the call seems to have brought forth a rare number of suggestions, bad, good, and indifferent, on the part of architects, engineers, and others. The latest of these possesses some features worthy of note. It is put in the form of "Suggestions for Abating the Liffey Nuisance," and emanates from Mr. E. H. Carson, C.E., architect, a member of the Irish Institute of Architects, and also a member of the Corporation.

New Lecture-hall for Hawkhurst. — A hall, which appears to be adapted to the wants of the place, is now in course of erection. The site chosen is at Highgate, the principal business part of the parish, adjoining the turnpike road. The ground is the property of Mr. Henry Maynard, of Oakfield, and this gentleman is at the entire expense of the building, which, we understand, will cost 1,000*l*. The architect is Mr. Alfred Williams, of Chancery-lane; the style Old English, and the size of the room itself 50 ft. by 27 ft. It will be available for lectures generally, concerts, penny readings, and entertainments of a moral and elevating kind.

Decoration of the "Bessemer" Saloon Steamboat.—The saloon is decorated with paintings and wood carvings, all the latter being of solid oak. There are panels in front of each division of seats, and they are so arranged that no duplicate design can be seen from any point of view. Natural foliage has been used surrounding shields, on which are carved the initials of the Company. The plants made use of are grape-vine, hops, oak, ivy, blackberry, filberts, figs, oak with ivy, tobacco, tea, and coffee. All these, with oak columns, surmounted with carved caps, newels, balusters, and girder coverings, have been designed and carved in oak by Mr. G. A. Rogers, and are creditable specimens of his skill.

Theatres.—The Theatre at Worcester is to be entirely rebuilt and enlarged. The new company, who have bought the property, have raised the whole of their capital in less than five weeks, Earl Dudley very handsomely heading the list of shareholders with 1,000*l*. Contracts were entered into on the 9th, and the building will be ready for opening about New Year's Day. Mr. Dixon, of Worcester, is the builder; and Mr. C. J. Phipps, F.S.A., of London, the architect. The Philharmonic Theatre at Islington, and the Nottingham Theatre, have both, during the past two months, been undergoing complete restoration and redecoration throughout by Mr. E. Bell, under the direction of the same architect.

The Architectural and Archæological Society of Durham and Northumberland.—The members of this society have visited Thirsk and inspected the church. They came by road by way of Mount Grace and Leake, and on their way inspected the Priory and the church at Leake. On taking their survey of the parish church at Thirsk, Mr. W. H. D. Longstaffe, of Gateshead, explained to the members the architecture of the building, and the ancient stained glass in the eastern window of the southern aisle of the edifice. He was also enabled to give the exact date of the building of the present tower.

Fall of Houses in Clare Market.—Several houses in Vere-street, Clare Market, have been known to be in a dangerous condition, and precautions were taken by the Board of Works to prevent their falling. It became evident, however, within the last few days, that these precautions were useless, and notice was given to the tenants to quit. On Friday last, about forty persons went out, and on Sunday morning two of the houses fell. Fortunately, the *débris* fell inward, or, in all probability, the crowded state of the locality on a Sunday morning might have resulted in the loss of life.

The Architecture of Barnard Castle.—The architectural acquirements have of recent years been rapid. But a few years ago a number of houses were clad in humble thatch, but contemporaneously with the erection of the Bowes Museum—a building which, when completed and open to the public, will have cost about half a million sterling—numerous villa residences on both banks of the Tees have been erected.

Safe.—Some burglars tried hard the other day to break into an iron safe at a house in Southwark-street. Great violence had been used in the attempt, the doors had been bent forward, and the ornamental iron portion torn clean off. A jemmy and crowbar were left behind, as if the burglars had been alarmed by some external noise, as no one was on the premises. There was a great amount of valuable property in the safe, and Messrs. Chubb are rather proud of the fact that the safe was made and supplied by them.

Railway and other Works at Chatham. At a special general meeting of the holders of arbitration ordinary stock in the London, Chatham and Dover Railway, held on Saturday at the Victoria Station, it was resolved to raise additional capital for the completion of the Chatham Dock Yard Branch, the building of an hotel over the Holborn station, and the purchase of new rolling stock.

Dwellings in Amsterdam.—An inspection has shown that 73 per cent. of the underground dwellings in Amsterdam, of which there are large numbers, are not fit for habitation. Out of 3,650 which were examined, 1,000 have no windows. It is proposed to form a society, with a capital of 1,800,000 florins, for the erection of workmen's houses, which will gradually supersede the cellars, and the scheme has met with a favourable reception.

Bursting of the Leeds and Liverpool Canal.—About eleven o'clock on Wednesday night the Leeds and Liverpool canal burst its banks near Alice Spencer's Bridge, Newburgh, between Burscough and Wigan. A breach was made of more than twenty yards in length, and through it the immense volume of water rushed with great force, washing away trees, and other things, in its course.

The Organ in Scotch Churches.—For the first time instrumental music is about to be introduced into a church in the Aberdeen Presbytery, Mr. John Duthie, shipbuilder, having offered to present an organ to St. Clement's Parish Church, Aberdeen, and the gift having been unanimously accepted by the congregation.

Rebuilding of Ancrum House, Jedburgh. Ancrum House, the seat of Sir William Scott, bart., which was totally destroyed by fire on the 3rd of December last, is about to be rebuilt. The new house will, we hear, be in the Scotch baronial style of architecture, the plans being by Mr. Wardrop, of Edinburgh, architect.

Kirkcaldy.—The Kirkcaldy Harbour Commissioners have appointed a committee to obtain plans of a proposed extension of the harbour, and to ascertain the terms on which the Public Works Loan Commissioners would grant a loan of 40,000*l*. for the purpose.

TENDERS

For rebuilding St. Nicholas's Church, Guildford. Mr. Evan Christian, architect (not Mr. Mellersh, as previously stated, who assisted in preparing the quantities):—

Wright, Brothers, & Goodchild	£7,915 0 0
Moon	7,654 0 0
Mitchell & Son	7,041 0 0
Harris	6,691 0 0
Goddard & Son	6,850 0 0

For a colliers' hall and club-house at Cwmtillery, Monmouthshire, for the South Wales Colliery Company. Mr. E. A. Lansdowne, architect:—

	Hall, exclusive of Club.
Phillips (accepted)	£1,150 0 0

For works for Messrs. Mason & Son, curriers, Bermondsey. Mr. Lankston, architect:—

Simmons (accepted)	£177 0 0

For works for Mr. Whichelow, fur seal dresser, Bermondsey:—

Simmons (accepted)	£257 0 0

For repairs to the Rose Tavern, Weston-street, Bermondsey, for Mr. Klumpp. Mr. John Viney, architect:—

Godden	£125 0 0
Hoare	124 0 0
Macintosh	118 15 0
Whitby, jun. (accepted)	95 0 0
Pewterer's Work.	
Heath	57 10 0

For alterations to the Shepherd and Flock, High-street, Marylebone, for Mr. W. Mainprice. Mr. John Viney, architect:—

Godden	£330 0 0
Hyde	323 0 0
Hill	297 0 0
Hebb (accepted)	233 0 0
Pewterer's Work.	
Heath	29 10 0

For bar fittings at the Prince of Wales, Drury-lane, for Mr. Thomas Broom. Mr. John Viney, architect:—

Shurmur (accepted)	£235 0 0
Pewterer's Work.	
Heath	67 10 0

For building two villas on the Brownswood Estate, Finsbury Park, for Mr. F. J. Peirson. Mr. John Viney, architect:—

Hammond	£2,100 0 0
Hoare	2,060 0 0
Atherton & Latta (accepted)	2,020 0 0

For works to Downes Bury, Steele's-road, Haverstock-hill. Mr. S. Hewitt, architect. Quantities supplied.

Titmas	£327 10 0
Hobson	275 0 0
Foxley	274 0 0
Patman & Fotheringham	249 0 0
Greenwood & Co.	239 0 0

For the erection of a house at Water's Place, Ware, Herts, for Mr. T. F. Buxton. Messrs. Smith & Austin, architects:—

Green & Son (accepted)	£1,185 11 4

For cottage hospital at Erith. Mr. Herbert Ford, architect. Quantities supplied by Messrs. Kerslake & Mortimer:—

Lewis	£1,678 8 6
Vickery	1,625 0 0
Warr	1,623 1 2
Lose	1,617 0 0
Powis	1,584 0 0
Tiver	1,548 0 0
Stampe & Bowtel	1,544 0 0
Crockett	1,537 0 0
Tongue	1,526 0 0
Wigmore	1,513 0 0
Lonergan	1,443 0 0
Niblett & Son	1,438 10 0
Smith	1,437 6 6
Knight	1,427 19 3
Webber	1,377 0 0
Staines & Son	1,370 0 0
Smale	1,363 0 0

For building new riding-school and infirmary stables at Brighton barracks:—

Colwell (accepted)	£4,500 0 0

TO CORRESPONDENTS.

J. & J. B. (already published).—J. T. (beyond our province).—J. C. (we do not know of such a patent).—J. F. (we cannot find the letter spoken of).—E. A. P. (thanks: we should not be able to afford the space).—C. H. (copies have been posted).—G.—A. D.—L.—P. B.—G. A. B.—Messrs. B. & M.—G. R.—T. B. V.—S. T.—C. C. H.—H. E. P.—E. J.—E. A. L.—C. J. P.—W. W.—S. & J.—O. S.—J. D.—E. L. B.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

CHARGES FOR ADVERTISEMENTS.

	Situations Wanted.	Situations Vacant.
Six lines (about fifty words) or under ..	2s. 6d.	4s. 6d.
Each additional line (about ten words)..	0s. 6d.	0s. 6d.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied, *direct* from the Office, to residents in any part of the United Kingdom at the rate of 10s. per annum, *Payable in Advance.*

Halfpenny stamps accepted for amounts under 5s. Any larger sum should be remitted by Money Order, payable at the Post Office, King-street, Covent-garden, W.C. to DOUGLAS FOURDRINIER.

Advertisements cannot be received for the current week's issue later than **THREE o'clock p.m.** *on THURSDAY.*

The Publisher cannot be responsible for TESTIMONIALS *left at the Office in reply to Advertisements, and strongly recommends that* COPIES ONLY *should be sent.*

Bath Stone of best quality.
RANDELL, SAUNDERS, & CO. (Limited),
Quarrymen and Stone Merchants.
List of Prices at the Quarries and Depôts; also cost of transit to any part of the Kingdom, on application to
Bath Stone Office, Corsham, Wilts. [ADVT.]

Asphalte.
Seyssel, Patent Metallic Lava and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [ADVT.]

Whitland Abbey Green Slates.—These Quarries are now fully opened out, and are producing Slates in all sizes, and in any quantity: sound, and of choice green tint.—For samples and further particulars, apply to the MANAGER, at the Quarries, Narberth-road, R.S.O. [ADVT.]